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Lt. R. L. Maughan, A. S., Winner of the 1922 Pulitzer Trophy Race

VOLUME XIII

Number 18

SPECIAL FEATURES

THE SECOND NATIONAL AERO CONGRESS

THE AERONAUTICAL BANQUET AT DETROIT

THE NATIONAL AIR INSTITUTE

THE GARDNER, MOFFAT CO., INC.
HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK

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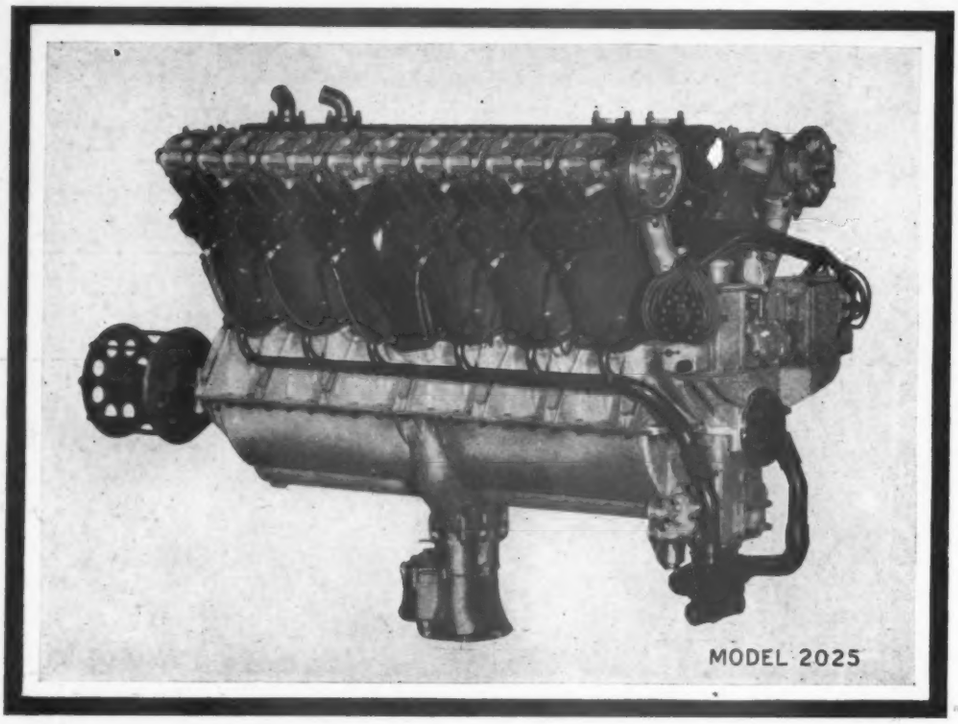

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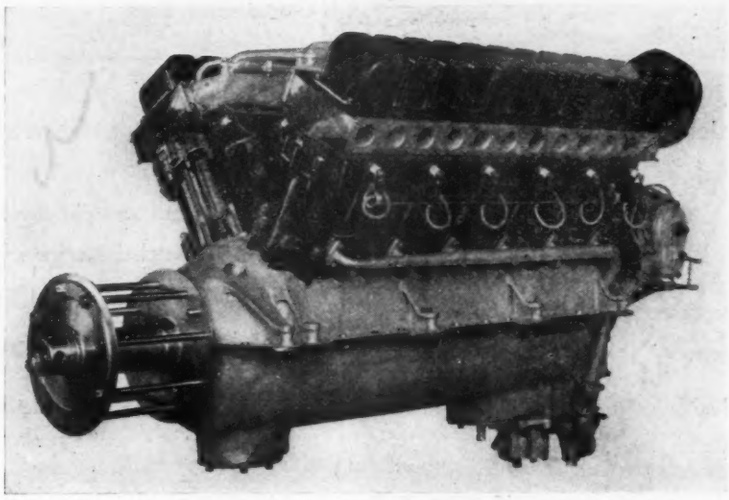

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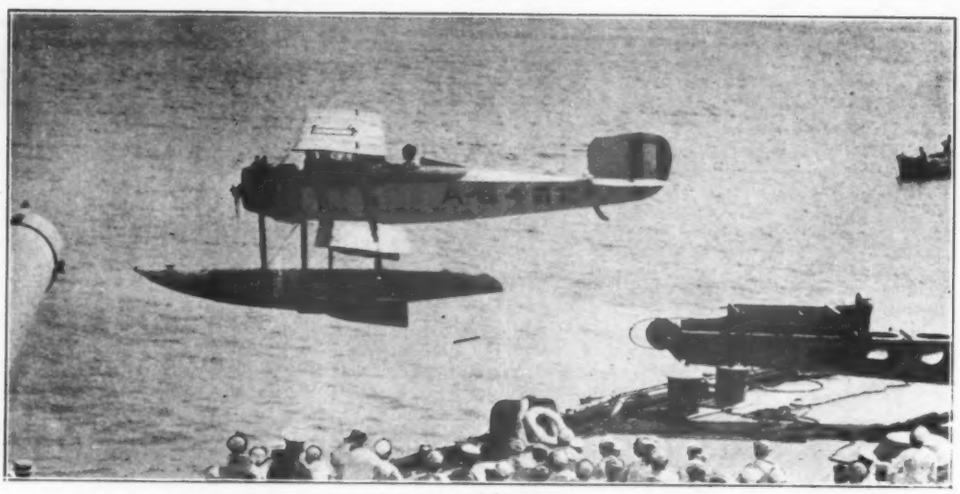

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LONG ISLAND CITY, NEW YORK

OCTOBER 30, 1922

AVIATION

VOL. XIII. NO. 18

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At Detroit

In the Aerial Mail Trophy Race, held at Detroit, October 12, four giant twin-motored planes, designed and built by the House of Martin, flew more than a thousand miles at an average speed of 102.6 miles per hour without the slightest mishap or failure of any part.

The outstanding feature of this race over all the other races at Detroit, including the one for the Pulitzer Trophy, was the uniformity of performance of all the planes. So consistent was the flying of each plane that not more than a few seconds variation was recorded, one lap with another, over the ten laps of the race.

The exceptional ease with which these large weight-carrying planes were able to duplicate the feats of the much smaller and faster scouts in turning the pylons and maneuvering, was another surprise. Any one witnessing this event could not but wonder at the performance of these great bombers where racing ability was a qualification wholly unintended. It was simply another indication of the extraordinary care given to the design of the famous Martin Bomber.

At Detroit, as at the bombing tests a year ago, Glenn L. Martin airplanes fully demonstrated their versatility as well as their unfailing performance and reliability.

Results of the Detroit News Aerial Mail Trophy Race for Muti-motored airplanes.

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2nd Martin Bomber *	Lt. Phil. Melville	103.4 m. p. h.
3rd Martin Bomber	Lt. C. B. Austin	101.4 m. p. h.
4th Martin Bomber	Lt. C. M. Cummings	101.0 m. p. h.
5th Martin Bomber ¶	Lt. G. E. Ballard	96.8 m. p. h.

* Converted Martin Mail Plane
¶ Not Martin-built

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AVIATION

LADISLAS D'ORCY, EDITOR
VIRGINIUS E. CLARK
EDWARD P. WARNER
RALPH H. UPSON, CONTRIBUTING EDITORS

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The National Aeronautic Association

A NOTABLE step forward was made in Detroit with the formation of the N.A.A. At last, the country has a nation-wide association that is truly representative of all sections of the country. Such a body has long been needed and the unanimity and confidence shown by the delegates in their deliberations is the best evidence of the success that will come to the organization under the new officers.

Membership is the great need during the first year and this will come from all sections of the country as the N.A.A. is the kind of an organization for which every one interested in aviation has been waiting.

Record Flight of General Mitchell

THE breaking of the kilometer speed record of the world by General Mitchell at Selfridge Field on Oct. 18 is a great triumph for the Army Air Service. For family reasons, Lt. Maughan could not make the test and General Mitchell volunteered, even though he had never flown the racer before.

His brilliant piloting of the speed plane has brought to him the distinction of being one of the greatest fliers of the world and again gives Army aviators evidence that they are led by a man who will take any chance he demands of them.

The New Trend in Naval Aircraft

THE Curtiss Marine Flying Trophy race served among other things to bring out what may be called the new trend in the design of naval aircraft. This new trend is mainly characterized by the growing reduction in size of the naval aircraft built in the last two or three years.

After the Armistice the trend of design was distinctly in the direction of aircraft of ever larger size. The NC type was the last word in this line of thought and the crossing of the Atlantic by one of these ships proved that the type was practical. A further step was to be achieved by the construction of the Giant Boat seaplane for which three multiple power-plants were built, embodying a total horsepower of 3600. This seaplane was not, however, completed, for in the meantime, the aviation requirements of the Navy had undergone a radical modification.

As long as naval warfare found itself under the shadow of the submarine menace, the coasts could best be defended by aircraft of long radius of action, based upon shore stations. The F5L and NC seaplanes were the consequent development. But once the German submarine menace was eliminated the Navy realized that it was in need of aircraft that would operate with the fleet and from the fleet—scouting, gun-spotting, fighting, bombing and torpedo-carrying planes. All these were needed by the fleet, but they did not exist, and they had consequently to be created through careful study and elimination.

Today the Navy has practically completed this program of testing under practical conditions the diverse types of aircraft it requires for the defense of the fleet as well as for offensive operations based upon the fleet. The TR type plane which won the Curtiss Marine Flying Trophy race is to be the ship-board fighting plane of the Navy, fulfilling at sea the duties which pursuit aviation carries out over land. In the Vought VE9 and UO1 planes the Navy posesses the scouting and gun spotting planes it has sought to develop for use on board its battleships and scout cruisers. Finally, the Davis-Douglas torpedo plane, which also can be used as a bomber, completed this program by affording the Navy the weapon required for offensive action against ships afloat and shore establishments. The only type of naval aircraft that yet remains to be brought to practical completion is a small scouting plane that could be carried on board destroyers and submarines. This type, which is more or less based on the Loening "Kitten," is now under consideration, and when it will have emerged from the experimental stage, the Navy will at last be adequately provided with the heavier-than-air craft it needs for naval warfare.

Development of Commercial Air Lines

ALL the successful air lines of which we have knowledge have been started on the smallest possible scale, without any widespread sale of stock, or an attempt to "blossom out" at the start with prematurely elaborate equipment and service. The proper course, as exemplified by successful air lines and by sound business policy in general, is obviously to start small, play safe, and expand only in proportion to the proven demand for the service. The airplane is inherently a small unit, and full advantage should be taken of the fact in these early stages of its commercial development.

For airships such a course is easier to council than to follow, for here is a unit that is inherently large and must be large for economical operation. For example, a long route like that between New York and Chicago, is usually considered better adapted to airships than airplanes. But this presupposes enough traffic immediately available to fill at least one good sized airship, which would be equivalent to a dozen or more planes of moderate size. Granting then that airplanes can be developed to fly over this route at night, which is practically essential, the general possibilities of the route might be tried out on a small scale by starting with planes rather than with airships. In this case intermediate landings would of course be made, and the business developed at these way-points would keep the airplane service in demand even after the through-traffic should be carried entirely by airship.

The Second National Aero Congress

Notable Aeronautic Gathering Establishes National Aeronautic Association of U.S.A.

The business sessions of the Second National Aero Congress were held at the Board of Commerce Building, Detroit, on Oct. 12 and 13 and the new organization, The National Aeronautic Association of the U.S.A. was formally established at Hartford, Conn., and its officers elected.

The First Session

At the first session, on Oct. 13, Harold H. Emmons, President of the Detroit Board of Commerce, acted as temporary chairman.

In greeting the delegates, he said.

We are inaugurating a national association for the purpose of putting on a solid foundation the latest and newest and at the present time most important in prospect enterprise that is now upon the horizon of these United States.

Transportation of all kinds has been used since the beginning of the world, in progressive stages from one to the other. The last system of transportation that is possible is that of the air. It is the one that is the last to come into its own. It is now here. It has arrived and it is time that it was put on a solid foundation and in this City where the next preceding transportation method; namely, by automotive gas driven engines had its home, and this is the appropriate place for the launching of this organization.

William P. MacCracken of Chicago was thereupon chosen permanent chairman of the Congress. Harold E. Hartney, who has been executive secretary of the Advance Committee on Organization was chosen secretary. The following committees were appointed by the delegates from each district.

The Chairman then drew attention to the fact that this Congress was the result of the amalgamation of the Aero Club of America and the National Air Association and called upon Dudley M. Outcalt, one of the founders of the National Air Association to give the history of that body. Mr. Outcalt said:

How the N.A.A. Was Formed

We met there, not as many as I would like to have seen were present, but I think almost everyone interested in the general cause in which we are meeting here today. We did not have the benefit of the splendid attempts to prepare the work of the Convention as met us here in this Convention and the result was that on the last day, three or four of us met in a general Committee to do the entire work of the Convention. We were the Resolutions Committee, Constitution and By-Laws Committee, all committees, and whatever work we thought important or which was presented to us we tried to do. The Constitution and By-Laws Committee worked until four o'clock and I myself borrowed a typewriter and wrote the Constitution and the Constitution was read to the Convention that morning at nine o'clock. Of course, the Constitution which was adopted at that place was full of holes, there were many errors, mistakes, it wasn't workable. But it held the germ of an idea and, gentlemen, you have all read the Constitution which has been presented to you by the Advance Committee on Organization, and, in general, that Constitution follows the Constitution which we adopted out there. There are features in the new Constitution which take in better features from other organizations. I believe that those who were particularly interested in preparing that Constitution used this Constitution, the Constitution of The American Legion, the Constitution of the Society of Automotive Engineers, and other societies, and we had success in preparing the idea which is to be presented to you after passed upon by your Constitution and By-Laws Committee.

The Chairman then called upon Godfrey Cabot (of Boston)

District Delegates of the National Aeronautic Association

Districts.	1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th	9th.
Credentials—	W. H. Beardsley F. N. Sherman	E. M. Ronne E. D. Ackerman, Chairman	H. F. Doelman R. E. Dake	J. A. Meissner V. H. Burgin	T. J. Herbert F. M. Strock	S C. Waldon W. F. LaFrenz	R. H. Page F. C. Mann	Edgar Tobin D. Duke	P. G. Johnson C. H. Messer
Resolutions—	G. L. Cabot P. H. Kemble	H. A. Scholle W. J. Hammer, Chairman	R. W. Springer J. B. Brooks	J. A. Meissner V. H. Burgin	L. W. Motley G. H. McClelland	J. G. Vincent R. C. Diggins	G. M. Bellanca E. J. O'Connor	L. Harvey D. V. Gafney	J. T. Holmes L. L. Westfall
Legislation—	E. J. Daly	E. Ely	W. F. Fullam, Chairman	J. A. Meissner	T. J. Herbert	W. Metzger	H. F. Wehrle	E. Tobin	J. Eaton
	E. P. Warner	T. C. Knight	P. V. Burwell	V. H. Burgin	J. W. Macklin	R. W. Allan	A. H. Fetter	D. Duke	P. G. Johnson
Constitution—	T. G. Holcombe P. H. Kemble	L. d'Orcy A. Black	C. W. Cooke W. D. Tipton	J. A. Meissner V. H. Burgin	F. L. Martin D. M. Outcalt, Chairman	H. Emmons B. J. Arnold	E. R. Schultz C. R. Miles	W. F. Long E. Tobin	P. G. Johnson C. H. Messer
Finance—	F. L. Cabot	B. F. Castle, Chairman	B. H. Mulvihill	J. A. Meissner	H. C. Wick	J. Mayer	L. Heinsheimer	W. F. Long	L. L. Westfall
	P. H. Adams	H. M. Crane	R. J. Walters	V. H. Burgin	J. W. Stevenson	H. M. Jewitt	W. Everson	D. Duke	C. H. Messer
Membership—	E. D. Warner	J. B. Taylor	E. Schildauer	J. A. Meissner	L. D. Bell	R. R. Ferguson, Chairman	V. Roos	L. Harvey	J. Eaton
	G. L. Cabot	W. E. Eaton	C. D. Chandler	V. H. Burgin	D. P. Muse	F. A. Vaughn	F. Carlson	W. F. Long	J. T. Holmes
Nomination—	T. G. Holcombe	L. D. Gardner	C. W. Cooke	J. A. Meissner	J. L. Young	W. A. Dudley	J. B. Coleman, Chairman	E. Tobin	K. Norgei
	P. H. Kemble	M. Cleary	H. F. Gordon	V. H. Burgin	Rex Uden	W. H. Hutton	R. Cram	W. F. Long	L. L. Westfall
Dist. Const.—	P. H. Kemble W. Noble	R. F. Hoyt H. A. Scholle	C. W. Cooke W. D. Tipton	J. A. Meissner V. H. Burgin	D. M. Outcalt F. L. Martin	H. L. Lyster G. A. Shoemaker, Chairman	J. B. Coleman R. Cram	E. Tobin W. F. Long	P. G. Johnson C. H. Messer
Permanent Rules		G. H. Hughes G. S. Stead	W. D. Tipton L. F. Sevier	V. H. Burgin J. A. Meissner	R. R. Palmer V. E. Clark	J. G. Vincent R. C. Diggins	G. Dietz C. A. McElvain	L. Harvey W. F. Long	K. Unger P. Johnson

At this point of the proceedings the photograph shown on the opposite page was made of the convention.

The Chairman then called for any resolutions from the floor and Professor Springer (Carlisle, Pa.) introduced a resolution requesting information on the qualifications of all governors and officers in the new association, showing their respective affiliations with aeronautical enterprises throughout the country. The Chairman referred this resolution to the Committee of District Constitution and By-Laws of the Convention.

A letter was then read by Captain McCauley from the Third District extending an invitation to the Congress to the 1924 Convention in Atlanta, Ga., C. S. Rieman (of Chicago) then arose and invited the convention to come to Chicago in 1923. Ralph Cram (of Davenport, Ia.) then arose and asked that the election of officers take place Friday night, Oct. 13, 1922. This was referred to the Rules Committee by the Chairman.

for some remarks on the Aero Club of America and he replied giving some concise history of the whole movement leading up to the present time. He said:

The Governors of the Aero Club of America, of which I am one, are heartily behind this plan, each and every one of them. I was at their last meeting which took place only a few days ago in New York and they are very anxious indeed that this meeting shall entirely succeed them in their activities. We are most heartily in favor of delegating all our functions to this organization. We hope that you will benefit by our successes and also by our failures. The great trouble with the Aero Club of America was that it was too local. We did not have enough active attendance in the meetings from points outside of New York City. There were a number of officers outside of New York City, myself among them, but most of us found it rather difficult to attend the meetings regularly and the result was that it was more or less of a local club and, therefore it did not keep as closely in touch with the clubs outside of New York City as was desirable.

We have now a number of very large aero clubs in this country. There is an enormous club in Seattle and there are many other cities where there are very large aeronautical associations. It is extremely important that we should have a well organized structure to act as a liaison between all

First Session of the Second National Aero Congress

these different clubs, to act as a go between between all these different clubs and the international organization, to give your sanction and approval of those clubs which are actively functioning, to discredit any attempt of any private individual and in general to discredit any attempt by any organization that try to derive benefits for their own selfish interests.

And I wish here to bring you the most cordial greeting from the Aero Club of America and all the officers the most heartfelt, sincere and deep hope that you will meet with the highest success in every way and the Aero Club of America promises the most cordial cooperation in everything you may undertake. (Applause)

Mr. Hartney's Speech

Harold E. Hartney, the Secretary (Washington) was then called upon for a report of the Advance Committee on Organization, H. E. Coffin, Chairman of that Committee being absent. Mr. Hartney said:

Probably some of you are not familiar exactly with the sequence of events leading up to this formation that is here this evening. Even before the war—and I know it was in the minds of those who established the Aero Club of America—there was a keen desire to keep the United States first in the air and they recognized even at that time that there must be an independent, non-partisan body such as you and I hope will be formed here now to keep the United States first in the air and to fight on behalf of this new child that was destined to be one of the biggest boys that ever the nation knew.

Now, the Aero Club was formed but the war came on. The Aero Club, as you all know, did magnificent work in the earlier days and we have the greatest respect for the officers who did that. We must not forget in all our work that we owe a great deal to their labors and remember too the struggles they went through in accomplishing what they did. The war came on and things were forgotten along that line in the great effort to kill Boches and the result was that things became a little slack, we are sorry to say, and although a lot of Reserve Officers did get in there and things became rather unwieldly, there was not time for men like Mr. Coffin to devote much attention to those affairs.

After the war some of the fliers got together, they realized that there was a big thing in this and they formed the American Flying Club. The American Flying Club soon amalgamated with the Aero Club of America but I am afraid that things were not quite properly organized and the result was it began to peter out. After a while somebody suggested that we clean up the whole situation and nationalize the Aero Club of America properly.

Just about that time the Omaha International Congress came along and negotiations were entered into with an organization there so that this great aim would be accomplished. Things drifted along for probably a month after that Convention but they worked pretty quickly and Mr. Crowell of the Aero Club of America outlined a policy that has been the slogan of those who have been behind the whole movement and we have kept that in mind while working here during the last few months. That policy was read before a dinner in New York and there was not a dissenting voice at that time, if I am not mistaken—I had not the pleasure to be present but I heard there was not a dissenting voice there to the policy as laid down. That was one of nationalization, of creating an association representing all interests and all territories, an organization that would keep the United States first in the air, a business organization, not merely an association proposition or a club proposition nor even a proposition organized for entertaining and pleasure, but something that was going to attend to a big, national business and I think we would be well advised to adopt in the administration of this organization this suggestion which is going to try to bring about a bigger policy than that on which some of us have been working.

We then hit upon the scheme of building an organization committee of one hundred, representing different communities and fairly distributed over the entire United States. We aimed at one hundred and sent out a portion of the invitations and there were 125 replies so we went back and we had to boost it to five hundred. That number has been reached and exceeded by two hundred. You see, there is a keen interest in this country. After that we prepared and sent out to those advisors little referendums as occasions arose asking advice on moves and we received some wonderful suggestions I must say. There were a lot of other little things done but probably the best of all was the formation of the District Organizations. Some did not respond; one was weak because it didn't understand the situation in the North here and it shook their confidence.

But otherwise everything was all right. Now, that gives you rougly the idea what brought you here. I want to take this occasion to say what Detroit has done. We could not have gotten anywhere but for them. The Detroit Aviation Society has paid the bills absolutely and they have assumed large responsibilites in getting you here together. I hope you will not forget in all your deliberations here at this time the work they have done and give them every support at every turn.

An outline of the proposed charter of the N.A.A. was then presented to the Convention and it was unanimously voted that the Chairman of the Nine Districts execute the charter of the National Aeronautic Association in Hartford, Conn.

The Chairman then requested that the committees should go into session at once, and gave them one-half hour in which to organize and nominate their chairmen and report back to him in the office of the President of the Board of Commerce of Detroit, on the first floor of that building.

Upon motions fully made and seconded, the Congress adjourned to meet again on Friday, Oct. 13 at 10.00 p. m.

Second Session

The meeting was called to order at 10.35 p. m. by the Chairman W. P. MacCracken (of Chicago), presiding.

Upon motion duly made by Mr. Outcalt of Ohio, and seconded by Mr. Scholle of New York, the reading of the minutes of the first meeting was disposed with and the minutes were adopted as recorded.

Godfrey Cabot of Boston, Chairman of the Committee on Rules and procedure, and Dr. R. R. Ferguson, of Chicago, Chairman of the Membership Committee, in turn gave the reports of their respective committees. The prospective membership was indicated by the following estimates:

(a) Honorary members	(not estimated)
(b) Federal honorary members	" "
(c) Life members	250
(d) Sustaining members	750
(e) Members	15,000
(f) Organization members	300
(g) Junior members	2,700
TOTAL	19,000

The other recommendations were practically identical with the tentative plans originally made for membership and qualification.

The Chairman then called for report from the Committee on Credentials and the Chairman, Mr. Ackerman, of New York, reported as follows: 379 accredited delegates viz: 11 from First District; 59 from Second District; 54 from Third District; 6 from Fourth District; 68 from Fifth District; 123 from Sixth District; 36 from Seventh District; 10 from Eighth District; 12 from Ninth District.

The Chairman then called for a report from the Finance Committee, and this was rendered on a basis of policy, budget and ways-and-means for financing. Colonel Castle of New York, Chairman of this Committee read the report which was as follows:

MR. B. F. CASTLE: (Chairman, Finance Committee) Mr. Chairman and Delegates, your Committee has received its duties as follows:

(a)—Enunciation of a financial policy for proposed Association.

(b)—Preparation of a Budget for the calendar year commencing Oct. 14, 1922.

(c)—Determination of ways and means of obtaining working capital during the first three months of the Association's existence.

FINANCIAL POLICY.

At the risk of indicating a fact that is obvious to everyone sincerely interested in the success of the National Aeronautic Association, your Committee desires to emphasize the necessity of extreme conservatism in the expenditures of funds during the first year of the Association's existence. If the membership is in accord with us on this point, we would point out that the Governors should of necessity fit their plans for expansion to the actualities of prospective financial situation of the Association, as shown in the budget accompanying this report. We are convinced that reasonable progress in organization can be made during the coming year within the limits of this budget and we feel certain that the ability to show a surplus, instead of a deficit, at the end of the present year, will result in the creation of a confidence in the permanency of the Association, which will give it the support it deserves from many interested citizens, who may now regard it as only one more Aeronautical Society destined to founder on the rocks of financial mismanagement.

BUDGET (Income)

There is only one immediate source of income for the Association—that to be derived from Membership Dues. Based upon membership classification and dues, as fixed by the By-Laws Committee, and from the number of members estimated for each classification by the Membership Committee, we estimate the gross prospective revenue as follows:

Before I take up the figures in detail I'd like to explain that since our last meeting with the Membership Committee, the Membership Committee revised its figures slightly. I have not had time to correct my figures and I do not think it makes any material difference.

275 Life Members	@	$500...$137,500, and Int. @ 5 per cent	$6,875.00
735 Sustaining "	@	50	36,850.00
15400 Regular "	@	5	77,000.00
Organization"	@	10. to $150	Not estimated
Air Board Organization Members	@	$25. to $150.	Not estimated
2,730 Junior Members	@	$2.00	$5,460.00
TOTAL			126,185.00

The Committee believe that 25 per cent of all Membership Dues should be retained by District Headquarters. Therefore, the revenue for National Headquarters will be 75 per cent of $126,185.00, or $94,638.75

EXPENDITURES.

The Committee has drawn up the following estimate of expenditures after careful consideration of every pertinent detail, but above all with the unanimous belief that the first year's work of the Association must be compatible with the fact that it must feel its way in order to avoid making a mis-step. We have provided for the creation of a relatively large reserve in order that at the next Convention the Association may have in hand working capital that will permit of the making of definite plans for expansion. The estimated expenditures in detail are:

I believe you will be interested in these figures. At the risk of boring you I shall read them.

Salary of General Manager	$ 5,000.00
Expenses (Traveling and Entertainment)	2,000.00
Office salaries	2,600.00
Organizers' expenses	3,500.00
Incidentals	2,000.00
Multigraphing	300.00
Office Supplies	300.00
Bills payable Nov. 1, 1922	1,500.00
Those are bills contracted by us during the last few months and the figures have been given to us by the Secretary of the Advance Committee.	
Prizes	3,000.00
Reserve $74,438.75	
Less 50 per cent 37,219.37	
TOTAL EXPENDITURES	$57,419.38
Plus Permanent Reserve	37,219.37
	$94,638.75

Which we will hope will be passed on by the next Convention.

Your Committee believes that the salary allotment for the General Manager is in keeping with the financial position of the Association, as well as with the immediate responsibilities and the scope of the work of his office, a man who is capable, who believes in the future of the Association, and who is willing to work and grow up with us can be found—any other type we do not want.

In indicating a gross amount to be set up as a reserve your Committee recommends that the Governors be permitted to expend 50 per cent of this work in connection with the expansion of our Association. The Committee has therefore incorporated 50 per cent of this reserve as part of the actual expenditure anticipated and we recommend leaving the balance as a real reserve until the next convention shall have assembled.

Col. Bion J. Arnold, of Chicago, at this juncture took the floor to sound a note of warning as to the importance of proceeding on a sound financial basis from the outset.

Ralph Cram of Davenport, Ia., then applied for the first organization membership. His application was referred to the new organization for consideration by the Governors when appointed.

The Chairman then called for a report from the Resolutions Committee and Maj. W. J. Hammer, of New York introduced the Secretary of the Committee Professor Springer, of Pennsylvania who read each resolution, each being passed unanimously.

Resolution I. National Policy

"WHEREAS, Navigation of the air represents the highest visible achievement in the progress of transportation and presents vast possibilities for good or ill to humanity, according to the spirit animating its use; and

"WHEREAS, This country, the first actually to prove and demonstrate the practicability of mechanical flight, should realize the tremendous opportunity presented to it, now, therefore,

"BE IT RESOLVED, That the National Aeronautic Association of the United States of America in Convention assembled at Detroit, Mich., Oct. 12 to 14, 1922, adopts the following as its national policy:

That the United States must be First in the Air.

That Congress should inaugurate a comprehensive, definite, and continuing policy of aeronautical development, military and civil.

That this nation should so develop its military and naval air services that our forces on land and sea may at all times be able to protect the nation from attack.

That a policy of development of air mail transportation should be carried out, which will encourage private carriers, and permit as well a healthy increase of existing government air mail routes.

That the continuous prosecution of co-ordinated scientific research under the direction of an independent group of scientific men, such as the National Advisory Committee for Aeronautics and the Bureau of Standards, is essential to any real progress in the development of aeronautics.

That all possible steps should be taken for the encouragement and development of civil aeronautics, through the creation of a federal agency to foster commercial aeronautics by providing for the regulation and licensing of aircraft and pilots, the establishment of airways and landing fields, and the developing of all facilites necessary for the conduct of air navigation.

"AND BE IT FURTHER RESOLVED, That copies of this resolution be sent to the President of the United States, to the members of the Cabinet, and to all Members of Congress."

Resolution II. Federal Legislation

"WHEREAS, The advancement of civil aeronautics is essential to our national prosperity and defense, and

"WHEREAS, The development thereof is retarded by the lack of Federal Legislation fostering and regulating aeronautics

"NOW, THEREFORE, BE IT RESOLVED BY THE NATIONAL AERONAUTIC ASSOCIATION OF U.S.A. IN CONVENTION ASSEMBLED AT DETROIT, MICH., OCT. 12 to 14, 1922, That Congress be urged to pass such Federal Legislation without delay, and to provide for an authoritative Federal agency to be established for the regulation of civilian aeronautics, and

"BE IT RESOLVED, That the National Association offer to the Congress its heartiest cooperation."

Resolution III. Transportation of Mail

"WHEREAS, The Post Office Department has indicated a willingness to enter into contracts with responsible corporations and individuals for the transportation of the United States mail through the air, to supplement the existing air mail service, and

"WHEREAS, The making of such contracts would be in the best interests of our mail service, as well as an aid in the advancement of aeronautics,

"THEREFORE, BE IT RESOLVED, By the National Aeronautic Association in Convention assembled at Detroit, Mich., Oct. 12 to 14, 1922, that Congress be requested to take appropriate action to authorize the making of such contracts by the Postmaster General at rates which will adequately compensate the carrier."

Resolution IV. Air Mail

"WHEREAS, During the past year the Air Mail has set up an exceptional record for speed, reliability, efficiency and safety, and

"WHEREAS, This record has been a demonstration of the possibilities of commercial aviation, and has been a continuing object lesson to the people of the United States of these possibilities, and

"WHEREAS, It is planned, after careful experiment and investigation, to introduce within the coming year a regular schedule of night flying on the transcontinental route, cutting down the time of delivery of mail between New York and San Francisco to approximately thirty hours,

"THEREFORE, BE IT RESOLVED, That the National Aeronautic Association of U.S.A., in Convention assembled at Detroit, Oct. 12 to 14, 1922, hereby expresses to the Post Office Department, and particularly to those in charge of the operation of the Air Mail, its gratification over the remarkable results so far achieved, and its appreciation of the progressiveness and far-sightedness of those officials in planning for the still further development of the service, and

"BE IT FURTHER RESOLVED, That copies of this resolution be forwarded to the Postmaster General, to the Second Assistant Postmaster General, and to the District Superintendents of the Air Mail and to each of the Air Mail Pilots."

Resolution V. Experimental Aeronautics

"WHEREAS, It is the recognized National policy for the Federal Government to maintain a small but efficient Air Service, and

"WHEREAS, It is realized that in time of war this Air Service would have to be rapidly expanded, and

"WHEREAS, The necessary types of equipment to be used by the various branches of the Air Service must always be kept abreast of the latest aeronautic development, which development of necessity must be conducted in time of peace so that at the outbreak of hostilities plans and specifications for the necessary types will have been developed so that production may begin immediately,

"THEREFORE, be it resolved that it is the sense of this Convention that Congress be urged to make adequate appropriations for the experimentation and development necessary for military and naval aviation."

At this jucture the Chairman saw that the Chairman of the Constitutions and By-law Committee was prepared to render his report and with the consent of the meeting allowed him the floor. It was moved by Mr. Kemble, of Massachusetts, seconded by Admiral Fullam, of the District of Columbia, that the Chairman read each and every article. Motion carried. Mr. Outcalt of Ohio, then proceeded to read each article. It was moved by Admiral Fullam, of the District of Columbia, seconded by Mr. Stevens, of Illinois, that the report be adopted.

Mr. Cabot then called attention to the fact that there was a slight discrepancy between the report on Membership and the one before the house. Upon motion of Professor Springer, of Pennsylvania, seconded by Mr. Kemble, of Massachusetts, the Committee on Membership was instructed to confer with the Committee on Constitution and By-laws with power to act in reconciling these differences.

Colonel Chandler, of the District of Columbia, called attention to the fact that the word "aviation" was often used where the term should have been "aeronautics" and the secretary was asked to make a note of this for future reference.

Colonel Clark, of Ohio, called attention to the fact that no provision was made for the Philippines. A discussion ensued in which Mr. Kemble of Massachusetts, Mr. Cooke of Maryland participated but no motion was made or change suggested.

Mr. Ely, of New York, called attention to the fact that the General Manager was not empowered to call a meeting. It was moved by Mr. Stevens, of Chicago, seconded by Mr. Adams, of Massachusetts, that Article 7, Section 8, be amended by including the words "from instructions from president."

Major Kirby, of Ohio, then moved that some provision be made for the Philippines, Panama and other territorial possessions by adding a tenth district. This was seconded by Mr. Clark, of Ohio, and a discussion ensued in which Professor Warner, of Massachusetts, Mr. Stevens, of Illinois, and others took part with the result that the motion was withdrawn by Major Kirby but with the consent of the seconder.

Chairman Outcalt then moved that the By-laws as revised be adopted, asking authority to re-number the sections in accordance therewith. Motion seconded by Mr. Tipton, of Maryland. The motion was unanimously adopted.

Mr. Outcalt then moved that the Congress validate the sending of the charter to Hartford, Conn., for approval on the morning of the 13th. Motion seconded and carried unanimously. The Chairman then called upon the Resolutions Commitee to continue its deliberations.

Resolution VI. Stunt Flying

"WHEREAS, The practice has grown up within recent years of including in exhibitions of flying throughout the country demonstrations of wing-walking, plane changing, stunting with passengers and similar hazardous stunts, and

"WHEREAS, Such demonstratons accomplish nothing to further the progress of aeronautics, but through the liability of serious accident occurring, with the attendant unfavorable publicity discredit and retard the advancement of the science,

"NOW, THEREFORE, BE IT RESOLVED: That the National Aeronautic Association of U.S.A., in convention assembled, at Detroit, Mich., Oct. 12 to 14, 1922, condemns as undesirable such exhibitions and directs that sanction be withheld from any meet contemplating the inclusion of such events in its program."

Resolution VII. Engineering Societies

"WHEREAS, The engineering professions have shown themselves in the past appreciative of all advances in the development of science and transportation, and

"WHEREAS, Their members are particularly adapted to understand and appreciate the future of aeronautics in this country,

"NOW, THEREFORE, BE IE RESOLVED, That the United Engineering Societies, composed of the national organizations of Civil, Mechanical, Electrical and Mining Engineers, be respectfully requested to lend their active support and cooperation to the aims and objects of the National Aeronautic Association of U.S.A., in securing the advancement of the art of Aerial Navigation, and

"BE IT FURTHER RESOLVED, That a copy of this resolution be forwarded to the Secretary of each of the constituent organizations of the United Engineering Societies.

"(Address 29 West 39th Street, New York City)
"Secretary of Civil Engineers
"Secretary of Mechanical Engineers
"Secretary of Electrical Engineers
"Secretary of Mining and Metallurgical Engineers."

Resolutions 8, 9, 10, 11, 12, 13 were expressions of appreciation to the city officials of Detroit, the Detroit Board of Commerce, Col. Sidney D. Waldon, the Detroit Aviation Society, the Government Departments and the Advance Committee on Organization.

Major Meissner, of Alabama, spoke on the National Guard and Organized Reserve but it was the sense of the meeting that no action should be taken at the meeting.

The Chairman then called upon Mr. Shoemaker, Chairman of the Committee on District Constitution and By-laws to report. He stated that the committee had found it impracticable to formulate a uniform constitution and by-laws for all Districts, and recommended that each district be given the greatest power of self-government, but that the districts be directed to submit their constitutions and by-laws to the Board of Governors for approval before adoption. The report was approved.

Mr. Outcalt, of Ohio, then called attention to the fact that several cities had made application for the 1923 convention and suggested that a committee be formed to report to the Board of Governors. The Chair then directed that this matter be referred to the Board of Governors.

Five Suggestions

Mr. Logan, of Ohio, then read five suggestions for contests and each was successively and respectively referred to the Contest Committee. The suggestions of Mr. Logan were as follows:

1. A contest for airplanes making the shortest run on taking off, carrying the maximum load, making the quickest ascent to 3,000 ft., cutting off their motors, making the longest glide in coming down and the shortest run after their wheels touch the ground, the weight per hp. and general commercial practicability of the airplanes to be considered.

2. A Race for airplanes making the shortest run on taking off, carrying the maximum load, and making five laps around a ten-mile course which shall be so arranged that two pylons shall be in view of the spectators, the economy and efficiency rules as set forth in the 1921 Contest at Kansas City to be combined with and made part of this event.

3. A Thirty Mile Handicap Race for airplanes, said Handicap to be in each case made on the basis of the Manufacturer's rating, said airplanes to be given their handicap at the start with a view to their finishing at approximately the same time, said Race to be so arranged that the spectators shall have a full vew of at least two pylons.

4. An Australian Pursuit Race for airplanes arranged according to their finish in previous races or events where such races or events are of a character to determine their racing capacity; and to be on the basis of the Manufacturer's rating for those airplanes which have taken part in other events which did not show their racing capacity.

5. A contest for airplanes making the shortest run in taking off and having the greatest height when passing over the hurdle, ascending to 2,000 ft. and when landing clear the hurdle and stopping closest to the hurdle.

Major Hammer, of New York, Chairman of the Resolutions Committee, called the attention of the Congress to an oversight on the resolution already discussed respecting National Guard Units and asked Major Meissner, of Alabama, for further explanation.

The following resolution was then passed unanimously.

Resolution VIII. National Guard

"WHEREAS, Under the National Defense Act eighteen States have been allocated National Guard Aero Squadrons, and

"WHEREAS, So far seven of these squadrons have been organized and have been wholly instrumental in keeping in training a large number of flying officers whose services would ordinarily be lost to the Government and a proportionate force of specialized airplane mechanics, radio mechanics and others essential to the operation of a squadron, all at a very low cost to the Government and State, and

"WHEREAS, Those States who have not organized their squadrons are apt to lose the opportunity to do so because of a movement to divert funds provided therefor to the organization of other units, and

"WHEREAS, Said action would be to the detriment of the Air Power of the United States,

"THEREFORE, BE IT RESOLVED, That each District of the National Aeronautic Association exert every effort to stimulate the organization of the National Guard Aero Squadrons allocated to the States within its boundary, and that the necessary action be taken whereby the generous offer of the Government be accepted, thereby preventing the diversion of these funds to other than Air Service Units."

The Nominations committee then made their report. The nominations were as follows.

For President.
Howard Coffin, Detroit.
W. P. McCracken, Chicago.
B. H. Mulvihill, Pittsburgh.

For Vice President:
Gould Dietz, Omaha.
A. B. Lambert, St. Louis.
W. F. Roberts, Baltimore.
E. S. Gorrell, Boston.
B. H. Mulvihill, Pittsburgh.

For Treasurer:
B. F. Castle, New York.
R. J. Glendinning, Philadelphia.

For Secretary:
Howard Wehrle, Kansas City.
John B. Coleman, Sioux City.
D. M. Outcalt, Cincinnati.
R. L. Uden, Cleveland.

After several nominees had withdrawn the list of officers unanimously elected was as follows:

President
Howard Coffin

Vice President
B. H. Mulvihill

Treasurer
B. F. Castle

Secretary
J. B. Coleman

Nominations for the Governors of the different Districts were then received as follows:

1st District: Porter Adams, Godfrey Cabot; 2nd District, John Larkin, Jr., Maurice Cleary; 3rd District, L. F. Sevier, R. J. Walters; 4th District, V. H. Burgin, L. Sevier; 5th District, Glenn L. Martin, Dudley M. Outcalt; 6th District, C. S. Rieman, Sidney Waldon; 7th District, Ralph Cram, H. F. Wehrle; 8th District, Edgar C. Tobin, Wm. F. Long; 9th District, P. G. Johnston, C. H. Messer.

The nominations were unanimously approved by the convention.

Mr. Kemble then introduced a motion of thanks to the Chairman of the Convention, and the sense of those present was unanimously in favor of tendering to Mr. MacCracken, of Illinois, the thanks of the convention for his services in this connection.

The Convention then adjourned.

The Aeronautical Banquet

The banquet held at the Detroit Board of Commerce on Friday, Oct. 13, was attended by as representative group of aviation followers as has ever been gathered together. Guests from Great Britain, France, Italy, Poland, Japan, China, Mexico, Brazil and Canada were present and the Army, Navy and Post Office Departments were also represented.

The speeches were limited to the toastmaster, Harold E. Emmons, President of the Board of Commerce; the Secretary of the Navy and Brig. Gen. Mitchell as it was desired to hold the second meeting of the convention immediately afterward.

Following are the speeches made by Secretary of the Navy Denby and by Brig. Gen. Mitchell.

Speech of Secretary Denby

I am here to learn what I can from this great lesson in American aviation. This is a joint maneuver by the Army and Navy for the comparison and development of the aerial arm of the two services. There is no question regarding the importance of aviation in our marine defenses or our commerce; it is here. The other nations of the world are paying much attention to aeronautics and we must keep abreast of them. Growing out of the events in Detroit this week especially, the demonstration at Selfridge, the discussion at the air institute, and the formation and deliberations of the Natonal Aeronautic Association, there should be a clear realization of the wisdom of providing for a maximum development of aviation commercially and as a part of the National defense.

It is the desire of the Navy department to establish its aviation upon the most effective basis. This means aircraft in the air, aircraft attached to surface fighting ships, aircraft carriers able to carry 100 planes apiece and aircraft on submarines. It also means aircraft attached to the land stations of our sea defenses. We have made a start in each direction but to realize what is necessary for our National security, we must build up and encourage a civilian aircraft industry and commercial flying, the rudiments of which we now have.

Finally, to obtain the fruits of scientific advance and progress in design and construction we must have demonstrations such as this one.

During my recent trip to the Orient, I was deeply impressed with the possibilities which aircraft offer. I flew at the Panama Canal, at San Diego and Honolulu, and again in China. At Honolulu I had the unique experience of stepping from a surface craft to an airplane and then from the airplane to a submarine.

We first flew to sea. The submarine followed us submerged. We returned and although the submersible was 30 or 40 feet below the surface, we saw it plainly. Later, we alighted and I boarded the submarine, thus compassing within a few hours the Navy's range of action on the water, over the water, and under the water.

As we steamed into Yokohama, Japanese airplanes flew out to greet us. In China, European nations have been quick to realize that a vast opportunity is offered for the introduction of aircraft forces. We should likewise be alert and seek our legitimate place in the airplane markets of the world. Just as a postal map of the United States has shrunk under the operation of the air mail so will the commercial map of the world diminish as the speed of communication increases.

Speech of General Mitchell

We have been called together to discuss ways and means for developing and maintaining "air power" in our country.

We may well ask—What is "air power?" The word "power" may be defined as "the faculty of doing or performing something." "Air power," therefore, means "the faculty of doing or performing something in the air." Just as sea power means "the faculty of doing or performing something at sea." or "land power means the faculty of doing or performing something on land." The three taken together "air power," "sea power," and "land power" constitute the total power of the state. On the one hand the military power is manifested in the active combat forces of the air, sea, and land, and on the other, the commercial air craft, sea craft, and the elements of man power industry, and raw materials, which form the sources from which the power of the state is derived.

Land power first started when man protected his fire side from the attack of wild beasts or his fellow savages. Sea power began when the Aboriginies found that wood floated on water and pushed out on rude rafts to gain their means of subsistence. Air power has started in our own day and there is not a man of one score years and ten who does not remember when the Wright Brothers, in our own United States first ascended in a heavier-than-air machine. This new science retarded by ignorance and prejudice struggled on, until the European War fixed its position in the armor of national defense. Its development since 1918 has shown its commercial usefulness.

Air power is a nation's first line of defense. It is the only means of combatting hostile air power. Means of defense against air craft from the ground or water have no more effect than spreading out a piece of fly paper to stop a grasshopper invasion of Kansas. Air power acting from land bases can absolutely guarantee the protection of the coast against sea craft. To further its military dominion over the waters all that is necessary is the development of the dirigible balloon or airship as an airplane carrier. Were we given today the cost of a modern battleship and told "Make a squadron of airplane carriers capable of destroying any hostile sea power in the middle of the Atlantic or Pacific," we could have them ready and delivered complete in 1927.

Material, equipment, and machines, however, are only a part of military air power. The men that handle them are the dominating feature. These must be developed and trained from the very beginning as air men, not land men or sea men. To train air personnel, first for something besides air and then for the air, is more than a waste of time, because in the first place valuable time is given to matters of little concern

The Aeronautical Banquet at Detroit, Oct. 13, 1922

This banquet, given at the Board of Commerce, attracted a notable gathering, including representatives of nine foreign air forces

to the air, and in the next place the years so taken up made the individuals old and unelastic mentally and physically to quickly acquire the doctrine of the air. What is of more advantage in the teaching of the Air Officer: To make him study in detail the operations of the land battle of Gettysburg, the sea battle of Trafalgar, or to learn from primary sources the air battles of July, 1918, at Chateau Thierry, the air attack at the Salient of St. Mihiel, or the sinking of the sea craft off the Virginia capes in 1921? Is it of more advantage to teach a prospective air officer to shoulder a musket and dig a hole in the ground to hide from a pumpkin slinger, which the enemy has dragged up a hill, or to give such a person a motor cycle to attend to entirely himself so as to teach him the care and construction of the engine, the management of the controls, and the quick handling of this instrument at high speed? What good does it do our air officer to place him deep down in a dug out with a gas mask on, or in a submarine, when he has to attack the enemy at 20,000 ft. in the air, use the clouds for concealment, and the sun, moon or stars for his friends and guides? So no matter how we decide to organize our air power, the obtaining and training of the personnel is of first importance.

We Must Have an Air Doctrine

To organize our air power we must have an air doctrine. The word doctrine means "that which is taught or the principles, belief, or dogma of any sect or party." Our air doctrine of national defense must be "to seek out the hostile main air force and destroy it." This short sentence may not convey much in itself, but analyze it. If we lose control of the air, the enemy can send his bombers wherever he pleases. He may attack our cities, our manufacturing centers, our means of communication by rail or by water, our ports and our capitals. He may destroy our means of communication of supply and of government, without which the national defense cannot be carried on. Control of the air is obtained by pursuit aviation. This is the basis of military air power. No other branch of aviation can operate against it. We know what may be brought against us in case of war and we know what we need to counteract it. What is necessary is one air brigade of 600 ships on the East coast, one air brigade of 600 ships on the West coast, and one air division of 1200 ships, distributed through the central part of the country. Only one fifth of this force need be constantly with the colors, the remainder may be in reserve. France, for instance, has 2000 ships on an active status and is ready to increase with her reserves to 4000 within two weeks after the declaration of hositilities. England has great air power and Japan is obtaining it rapidly. The cost of such a force and the number of men required to man it is only a small fraction of what would be required in other branches of the national defense to carry out a limited mission, and even then there would be no defense in the air. To concentrate and maneuver our air force we need airways, not only all over the United States proper but to Alaska, Panama, and the Caribbean Sea. These same airways may be used by our commercial aviation in time of peace, and conversely, in time of war all our commercial aviation may be used for military purposes. Most people have been lead to believe that commercial aviation consists of what we air people call jits, gypsies, and wing walkers, the jits being ancient aircraft that make special trips for exorbitant prices from one place to another, the gypsies being itinerant airmen with equally ancient aircraft that move about and give people a hop for the thrill they obtain; while the wing walkers are those that appear at county fairs, and entertain the spectators with feats of daring for spectacular effect. This is not commercial aviation. Commercial aviation means a regular and constant intercourse by air between points which require personnel, goods, and correspondence to be transported in the most expeditious manner possible. Evidently if we do not know what there is to transport, what the cost per pound is by present transportation, and what its cost by air should be to compete with existing means of transportation, we have nothing tangible on which to start. So the first thing we must do is to make an "air transportation survey" of the whole country to determine what distributing points are the most advantageous and what personnel, goods, and correspondence may be moved at a profit, due consideration being given to the time element in these compilations. Having obtained these figures we can devise airplanes and equipment which will transport these things at a minimum cost. Until such time as the commercial air service gets on its feet I am convinced that Government assistance is necessary, very much as it was with our railways in their beginnings. We should also encourage the large municipalities to concentrate their transportation facilities in one place. At the present time, the way railway terminals are scattered about a city, steamship terminals at another, and the airdromes miles away from either are expensive, inefficient and a source of great delay. In a city which has air, land, and water transportation facilities, a location should be selected along the harbor, the railway terminal should be made with steamship wharves along side, and the whole should be roofed over for an airdrome, where the air liners could deposit their passengers and freight, while facilities for motor transport for short hauls could be provided. Office space, markets, and express distributing points could be rented and help to pay for the upkeep of such a structure. The city first having such an arrangement will have a great advantage over its competitors, because the maximum advantage can be taken of the most economical means of transportation and a minimum of time will be required for handling and transfer from one means of locomotion to another. Until we establish a sound commercial aviation we cannot develop a real airplane industry.

At present almost all of our aviation is that employed by the Government in the Army, Navy, Post Office or other activities. It is dependent on political exigency and the temporary whims of individuals. There has not been and cannot be a consistent development of aviation under the present system. The deficiencies are so numerous that it would require too much space to enumerate them here. They have been brought to the attention of each department of Government and the Congress innumerable times. What is necessary is a systematic education of the people as to what air power means and what is necessary to maintain it. This the Air Congress now convened can do.

Some Recommendations

The recommendations of this Congress should be as follows.

(a) The establishment and maintenance of an offensive air force of 1800 airplanes.

(b) The establishment and maintenance of airways, and a steady scheduled postal air service along them.

(c) A subsidy for commercial aircraft and the regulation of flying on a national basis, both for personnel and material.

What we want is air power in the air, not around the council table or in a lot of regulations drawn up with nothing to regulate.

After a careful survey of our deficiencies and failures in the development of our aeronautics the most important single thing that can be done is the creation of a joint committee of Congress which shall consider our whole problem of national defense according to the changes which have affected it in recent years. We are still operating under a system developed in our former wars.

My final recommendation to this Congress is that it advocate that a joint committee of the Senate and House of Representatives be created for the purpose of studying our whole problem of national defense and apportioning the specific duties and responsibilities, which shall be performed by "air power," "land power," and "sea power."

Lasne Wins Deutsch Cup

The Deutsch de la Meurthe Cup race, held at Etampes, France, Sept. 30, was won by the French entrant Lasne, flying a Nieuport-Delage "sesquiplane" fitted with a 320 hp. Hispano-Suiza engine. Lasne who was the only competitor to finish, completed the 300-kilometer course in 62 min. 11 4/5 sec., or at an average speed of 290.88 kilometers per hour (177.33 m.p.h.). Lasne's machine was the same on which Sadi Lecointe won the Deutsch Cup race in 1920.

A detailed account of the race will appear in the next issue of AVIATION.

Detroit Convention Impressions

National Aeronautic Association Organized with Great Success

The Second National Aero Congress which was held in Detroit on Oct. 12 and 13 and during which the National Aeronautic Association was organized will probably prove to be the beginning of a new era in American aviation.

Endorsed by President Harding, the Secretaries of War and Navy as well as other aero organizations, the association should soon become representative of all that is best in aeronautic development, both national and civilian.

Commercial Aviation the Vital Background

Howard Coffin, Chairman of the Advance Committee on Organization indicated the scope of the association when he said:

"Commercial aviation is a vital background in all military-naval plans for the national defense, and the earliest possible steps must be taken for its encouragement. Federal laws for the control and regulation of all flying are of an immediate and crying need. Life and property must be safeguarded and a foundation of public confidence laid for the commercial progress of this newest and fastest of the transportation arts. The attitude of mind of our Federal, State, and Municipal authorities must be directed along sane and constructive lines.

"We stand on the threshold of a new realm of navigation and travel—the uncharted ocean of the air. Our usages of the high seas have been three thousands of years in the making, but our admiralty laws of the air must be written almost overnight. Even the ownership and control of the air above us are as yet an open legal question. Just as we now have International, National, and Inter-state regulations and agreements covering rail and steamship travel and the safety and navigation of the seas, so must we have similar regulations governing aircraft and the operation of such craft throughout the world.

"The dangers of aviation must be eliminated. An authoritative Federal agency must be established by legislative action, and charged with the examination and license of both pilots and aircraft engaged in any commercial or private service. Federal inspection of all ships for airworthiness must be provided.

"Questions of port regulations and customs procedure, of taxation and insurance, of safety equipment and underwriters' regulations, the charting and equipment of air routes for day and night flight, the provision of meteorological data—all these and countless other aviation essentials must be given an early and orderly consideration.

"Scientific research must be in every way encouraged.

"Certainly the National Aeronautic Association has work enough ready at hand!"

The work of the Advance Committee showed itself to be well done when it was found that every district was well represented at the meeting. To Secretary Hartney and Admiral Fullam were given the highest praise and appreciation by those who came from the districts that had been organized by their efforts.

The reasons for the organization of this association were given in the bulletins issued during the convention.

Purposes of the N.A.A.

The purposes of the new national association are based upon clearly existing needs. Ten years hence there may exist other requirements, purposes, and policies, made imperative by development in the art, but our immediate activities should comprise these:

Officers and Governors of the National Aeronautic Association

PRESIDENT

Howard E. Coffin
Detroit, Mich.

VICE PRESIDENT	*TREASURER*	*RECORDING SECRETARY*
B. H. Mulvihill Pittsburgh, Pa.	Benjamin F. Castle Mount Lake, N. J.	John B Coleman Sioux City, Iowa

GOVERNORS

1st District: Porter Adams, Boston, Mass; Godfrey Cabot, Boston, Mass.
2nd District: John Larkin, Buffalo, N. Y.; Maurice Cleary, New York.
3rd District: L. F. Sevier, Pittsburgh, Pa.; R. J. Walters, Baltimore, Md.
4th District: V. H. Burgin, Atlanta, Ga.; L. Sevier, Birmingham, Ala.
5th District: Glenn L. Martin, Cleveland, Ohio; Dudley M. Outcalt, Cincinnati, Ohio.
6th District: C. S. Rieman, Chicago; Sidney Waldon, Detroit.
7th District: Ralph Cram, Davenport, Iowa; H. F. Wehrle, Kansas City, Mo.
8th District: Edgar C. Tobin, San Antonio, Tex.; William F. Long, San Antonio, Tex.
9th District: P. C. Johnston, Seattle, Wash.; C. H. Messer, Spokane, Wash.

PERMANENT CHAIRMAN OF NINE DISTRICTS

1st District—Porter Adams.
2nd District—E. D. Ackerman.
3rd District—B. H. Mulvihill.
4th District—Van H. Burgin
5th District—Glenn L. Martin.
6th District—C. S. Rieman.
7th District—Ralph W. Cram
8th District—Edgar Tobin
9th District—C. H. Messer.

(a) To maintain in the headquarters of the association in Washington an agency capable of voicing a vigorous public opinion upon beneficial and essential legislation in all matters of aviation;

(b) To awaken and educate the public mind to the possibilities of aviation, both as a vital means of national defense and as a transportation factor in the commercial development of our country;

(c) To supply an impartial medium through which the thought of all sections of the country may be collected, collated and harmonized into a national expression of opinion;

(d) To encourage and promote the study and advancement of the science of aviation, and to maintain an institution which will collect and disseminate general and technical data for the development of the industry;

(e) To sanction and actively supervise under license of the Fédération Aéronautique Internationale all contests, trials, competitions and other events involving aerial craft or apparatus, and to approve all records in connection therewith.

For nearly a week before the convention the Executive Committee held daily meetings. At these meetings policy, procedure and organization were discussed so that the work of the sessions could be effectively despatched.

The incorporation papers of the new association were handled in a way befitting the purposes of the organization. They were signed by the incorporators early Friday morning, Oct. 13, taken to Selfridge Field and handed to an Army pilot. He was told that they were to be filed at Hartford, Conn., at the earliest possible moment. He started from Detroit by airplane and reached Hartford in six hours and twenty-three minutes and the charter was filed with the Secretary of State in time to have the convention learn on Saturday that the association was duly incorporated under the laws of the state of Connecticut.

The work of the various committees was accomplished under very trying circumstances as most of the work had to be done in all night sessions.

The Constitution and By-laws as suggested in the advance announcement were modified in many ways, notably in adding "Federal Honorary Members" to the classes of membership; a clause defining more clearly the membership of Air Boards in the association with dues ranging from $25 to $150 a year, and changing the number of governors at large from twelve to five, reducing the total number of governors from thirty to twenty-three.

The question of including widely separated states and territories in the same district was discussed on the floor of the convention, and while it was felt that Panama and the Philippines should have representation, it was decided to leave their inclusion to the Executive Committee.

The Finance Committee made a very comprehensive report which is printed elsewhere in this issue. It appeared to be the feeling of the delegates that a conservative financial policy should be adopted for the first year. As the income was based entirely on membership, it was emphasized that the work of this committee be given all possible support.

The National Air Institute at Detroit

The Influence of Aviation on Finance, Insurance, Law and Transportation Discussed at Detroit Meet

A National Air Institute, at which authoritative speakers discussed before a notable gathering the various phases of the art as affecting finance, law, insurance, transportation, etc., was held on Wednesday, Oct. 11, at Detroit preliminary to the opening, on the following day, of the National Air Congress.

The National Air Institute was held under the auspices of the Detroit Aviation Society, arranged by a composite committee representing the Aeronautical Chamber of Commerce of America and the American Society of Mechanical Engineers. Co-operating with the above have been the American Bar Association and the National Underwriters Association.

Prof. Herbert C. Sadler, head of the Department of Naval Architecture, Marine Engineering and Aeronautics at the University of Michigan presided.

The Institute was opened with an introduction by Sidney D. Waldon, president of the Detroit Aviation Society.

Col. Paul Henderson, Second Assistant Postmaster General, then spoke on the Air Mail with particular reference to preparations being made for night flying which will reduce the mail flying time from Coast to Coast to 28 hours.

He was followed by Joseph S. Ames, Director of the Physical Laboratory, Johns Hopkins University, Baltimore, Md., and Chairman, Executive Committee, National Advisory Committee for Aeronautics, who narrated his experiences and observations on scientific aeronautical progress during a prolonged tour of the major European countries last summer.

The next speaker was Lewis E. Pierson, Chairman of the Board of the Irving National Bank, New York City, and President of the Merchants Association of New York, who read a paper on "Commercial Aviation and the Commercial Bank—Their Relation to Each Other and to Trade."

Charles F. Redden, President of Aeromarine Airways, Inc., then outlined the experiences of his company in the pioneer transportation of passengers by air over the water.

C. G. Peterson, assistant to the President, Wright Aeronautical Corp., Paterson, N. J., and a former Lieutenant Commander in the Navy, presented the substance of an intensive study of the necessary investment, cost of operating, etc., required for a land air transportation company, specializing in mail and express, between New York and Chicago.

William P. MacCracken, chairman of the Aviation Committee of the American Bar Association, a former major in the Air Service, and now an attorney in Chicago, discussed "Air Law."

J. Rowland Bibbins, Director, Department of Transportation and Communication, Chamber of Commerce of the United States, Washington, D. C., contributed a paper on "Commercial Air Transport, the Next Step for American Business."

Edmund Ely, of New York, an official of the Aetna Life Insurance Co., and President of the National Aircraft Underwriters Association, talked on the insurance needs of aviation.

E. P. Warner, Professor of Aeronautics, Massachusetts Institute of Technology, Cambridge, Mass., who conducted the American party participating in the French and German gliding and soaring competitions last month, reported on "Commercial Aeronautical Development in Europe."

Excerpts from these contributions follow.

Opening Remarks

By Prof. H. C. Sadler

Transportation throughout the ages has been the primary factor in the advance of civilization. It has enabled men to communicate or trade with other men and so spread knowledge and ideas. It is the keynote today of all commercial enterprise, and often the governing factor in the success or failure of almost any business.

Nature has provided us with three media in which it is possible to transport ourselves or our goods: the solid earth, the liquid water, or the gaseous air; and in passing, it may be remarked that the last possesses infinitely more possibilites than the first two. From the very nature of things man was originally confined to the earth and water, because of his unfortunate development as a creature of the earth. Probably this may have been a wise provision because it has stimulated the mind of man, until today, he has in many respects far exceeded the performance of those other beings whose development in the early stages of evolution led them to adopt the air as their special medium of transportation.

Throughout the ages also, one other fact stands out with undeniable force, and that is, speed. Go back if you will to the road, the river, the sea, and you will find in history the inexorable demand for increase in speed. What is the use of talking about the "good old days" when people

took things more leisurely? We can no more go back to the days of the coach or the clipper ship, or cut out the use of the telephone, telegraph or radio, than, as the old sage remarked centuries ago, "You cannot turn back the hand on the dial of Ahaz."

Anyone who has made even a most elementary study of transportation must have realized the fact that on land and sea we have about reached our limits of speed. While it may be possible to increase speed on land and sea with advance of scientific and engineering knowledge, there is a practical limit from purely physical and economical considerations, beyond which it is not possible to go. A railroad train could possibly be run at 80 m.p.h., but in a great railroad system, this would be as a comet from another sphere. It cannot be made to work practically. The same applies with equal force to water. While our big ocean liners today are much faster than those of twenty years ago, it is very doubtful if any further increase in speed is economically sound. In fact, the tendency is somewhat in the opposite direction, owing to the unfortunate physical laws that compel us to pay an exorbitant tax in power and hence cost of operation, for each small increment of speed.

How then can we meet this demand of the future for increase in speed? We have still the one element left in which this is possible, viz., the air. Here again nature has been kind in providing a medium where it is possible to obtain speeds far in excess of those on land or sea, or even under the sea, with a relatively moderate expenditure of power.

Even granted that from an engineering point of view it would be possible to increase the speeds of land and water transportation, say 50 per cent, what is this compared with an increase of 100 to 200 per cent or even more, in the air, especially when from an economic point of view, the one is impossible and the other feasible?

In conclusion, I would venture to state the facts in a somewhat more forcible way; the air is the only medium left to mankind in which it is possible to attain materially greater speeds of transportation with the strong probability of commercial success.

The Air Mail

By Col. Paul Henderson

The Air Mail Service is limited by law to one Transcontinental route from New York to San Francisco. This route is 2,680 miles in length, making a round trip of 5,360 miles. This round trip is covered each day except Sundays and holidays of the year. This necessitates an annual schedule flying on the part of our force of approximately 1,800,000 miles. The eastern terminus of our route is Mineola, L. I.; the western terminus, Presideo, San Francisco. The intermediate landing fields are as follows: Bellefonte, Pa.; Cleveland, Ohio; Bryan, Ohio; Maywood, Ill. (Chicago); Iowa City, Iowa; Omaha, Nebr.; North Platte, Nebr.; Cheyenne, Wyo.; Rawlins, Wyo.; Rock Springs, Wyo.; Salt Lake City, Utah; Elko, Nev., and Reno, Nev.

How Mail Is Advanced

Our service at the present time consists of a relay advance of mail from New York across the Continent, and vice versa. That is to say, we do not take any particular mail for a complete trip across the Continent. We advance certain mail into Cleveland which misses the late night trains out of New York. We take from Cleveland into Chicago mail which, if we did not carry it, would go into Chicago on a train too late for delivery in the afternoon. This process is repeated in relays across the Continent with the net result that we advance approximately 12,000 lb. of first-class letter-mail each day a matter of some three or four hours. It should be noted that this three to four hour advance may in certain instances mean a real advance of fifteen to eighteen hours, inasmuch as it may mean the delivery of the mail to consignee late in the evening, which might otherwise have not been delivered until the following morning.

The planes which we are now using are remodeled De Haviland planes, which we procure free of charge from the Army. As of this date, we have seventy such planes in flying condition. Twenty are in the air each day and about twenty-four are in process of being overhauled and rebuilt. Our engineers have found it necessary to make some 200 changes in the design of the ship in order to make it suited to the job of mail carrying.

We use Liberty motors, also procured without charge from the Army. Our experience has shown us that at the end of 100 hr. flying service it is necessary to overhaul each Liberty motor. This we do at an average cost of about $250 per motor. At the end of 300 or 400 hr. flying service we overhaul the ships themselves. The major portion of this overhauling and rebuilding is done in our shops at Chicago, which shops are rather complete and employ approximately 100 men.

2,000,000 *Miles in Safety*

From July 16, 1921, until Sept. 7, 1922, we flew approximately 2,000,000 miles without a fatal accident. During the fiscal year ending June 30, 1922, we maintained an efficiency of 94.39 per cent. This means that out of every 100 trips scheduled, 94.39 were finished on schedule time. Our records show that two-thirds of our trips were made in clear weather; one-third were made in foggy, cloudy or stormy weather.

On Sept. 16 we finished ten consecutive weeks of flying the entire trans-continental route with 100 per cent efficiency; that is to say, during those weeks each of our scheduled trips was started and finished exactly on schedule time. It should be remembered that our daily route includes the crossing of three mountain ranges, the Allegheny Mountains, the Rockies and the Sierras.

There are employed in the Air Mail Service 390 people, of whom thirty-nine are pilots. With three or four exceptions, our pilots are all ex-Army or Navy flyers. They are exceptionally high-grade young men and to them is due much credit for the success of the Air Mail Service.

The Importance of Scientific Investigation in a General Aeronautical Program

By Dr. Joseph S. Ames

By a scientific research is meant the investigation by trained scientific men, in a properly equipped laboratory, of the fundamental phenomena of nature. The study of why an airplane wing has lift, of how the lifting force is distributed over the wing, of how this distribution is affected by changing the shape of the wing, are all scientific researches. They could not be effected except by trained scientists working under the same conditions as in a physical laboratory.

Modern airplane construction today rests upon the classical experiments of Langley, Maxim, the Wright brothers, and Eiffel. The marvelous achievements during the late war would have been impossible without the experimental work done at the National Laboratory of Great Britain and at the Gottingen Aerodynamic Laboratory. The underlying reason why so little progress has been made in design since the war is that there has been so little added to our knowledge of aerodynamics in recent years, owing to the lack of financial support given work of this kind, not simply in this country but in all the countries of Europe.

In considering any program for the development of aviation, the first point to emphasize is the need of stirring the imagination of the people as a whole to make them realize the importance of aviation to them as individuals; the second point is to make the men already interested in aviation appreciate that all progress depends upon the acquirement of knowledge, of new knowledge. This last can be obtained only by long continued investigations, directed by men who know the problems and the methods to be used for their solution.

Researches at Langley Field

I shall take three illustrations only of recent researches made by the National Advisory Committee for Aeronautics at Langley Field, so as to make clear the bearing of such work upon the practical side of the matter:

Every designer and constructor of airplanes must know not simply the total force which the wings and each part of the airplane structure may be subjected to in steady flight and in maneuvers, but also how this force is distributed—where is the greatest load, how does it vary in amount and position in a loop or in a dive, etc. In the same connection, it must be known how this distribution of force is affected by changing the shapes of the various parts: Should, for a particular purpose, the wings be square-cornered or elliptical, or should they have a rake-off, etc? All these questions and practically all others that can be asked about similar matters can now be answered as the result of the Committee's investigations. Furthermore, the Committee is now prepared to make a complete study of similar problems concerning airships. Until this knowledge is available, the construction of airships must be guided by purely empirical considerations.

Again, when an airplane is completed and ready for its acceptance tests, the method in use today, in this country and also in Europe, is to have the machine flown by one or more test pilots. They make a report concerning their impressions; does it respond easily to controls, does it feel stable, etc. These are simply reports of men's reactions, and may or may not have relation to facts. Furthermore, any pilot's impression is in reality a mental comparison between the machine he is operating and one he is accustomed to and may like. Such a comparison is not designed to be favorable to new models or to new devices. The Committee has constructed an instrument which records photographically the motion of each of the controls of an airplane and also simultaneously the effect of such motion. The linear and angular velocities and accelerations are obtained from these records, and every question concerning the controlability, maneuverability, and stability of the airplane may now be answered definitely. We have advanced from psychological impressions and guesses to records and facts.

Lastly, when a new design of airplane or of an airplane part is made, it is customary to construct a model of it, one-twentieth the size or less, and to experiment upon this. The method now in universal use is to suspend the model from suitable balances in a stream of air drawn through a large tube at a velocity of 60 m.p.h. or more. The balances register the forces and moments acting on the model. From the results of such measurements one decides whether the original design is good or not. But is one justified in making such a decision? Why should the same laws apply to a little model inside the wind tunnel, as it is called, and to the actual airplane flying freely through the air? Evidently there is ground for grave uncertainty. The Committee has perfected a method for obviating this. It has been known from aerodynamic theory for some time that the change in scale, from the airplane to its model, could be compensated by compressing the air from ordinary pressure to 20 or 25 atmospheres; as the structure moving through the air is reduced in size from 50 ft. to 2 ft., the molecules of the air are brought, by compression, closer and closer together until their distance apart is one twenty-fifth of what it was originally. The effect of change in scale is thus fully compensated, and experiments upos a model in this compressed-air have a real meaning. The Committee has constructed a large steel tank, 34 ft. long and 15 ft. in diameter, inside which is placed a wind tunnel with its balances, etc., and in which the air may be kept in a state of high compression. The information to be obtained from the apparatus will be the most important ever given airplane designers.

These three illustrations should serve to prove that, without such experimentation on progress in aviation is impossible and that therefore the liberal support of aerodynamic laboratories should be urged most strongly in any aviation program.

Commercial Aviation and the Commercial Bank - Their Relation to Each Other and to Trade

By Lewis E. Pierson

Air transportation is one of the incompletely developed facilities of modern commerce while the commercial bank is merely one facility that may perhaps be considered to have completed long since its development stage.

If one clearly apprehends the function of a modern bank one cannot fail to see that it comes into being only as a result of industry and commerce and is not the forerunner of those two manifestations of modern economic life. Hence, we arrive at the rather surprising conclusion that commercial banks need aviation more than aviation needs them. This does not imply the present readiness of commercial banks to finance the development of air transportation—it simply means that banks will benefit in direct ratio to the contribution which aviation will make to commerce. That this contribution will be very great no one seriously doubts, and, therefore, the up-to-date banker must give serious thought to the part which

he must play now and in the future in assisting to bring about the realization of the plans of those who are today laying the foundations of America's aerial commerce.

To Hasten Co-ordination and Co-operation

I believe that bankers can be helpful and I am also sure that the most certain method of assuring a close co-operation is by clearing away all misunderstandings that may exist—the misunderstanding of the banker regarding the capabilities of air transportation as well as the misunderstanding of those in aviation regarding the true role of the commercial bank.

I shall leave to other speakers well versed in the new science the duty of clearing up the very foggy ideas of bankers regarding the technique of air transportation as a fact in modern commerce. My obligation in this matter as I see it is to set before you the ensemble of aviation in its present stage of development as a commercial banker sees it, to point out its weak spots, and then to consider with you ways and means of hastening the day when the bank facility and the air transport facility of modern commerce will function co-ordinately as instrumentalities of commerce with mutual benefit to each other.

You desire, and expect, a certain amount of conservatism in your banker—you do not expect to find him losing his sense of proportion when the enthusiastic conceptions of the budding aviation engineer are laid before him. His conservatism may be a means of defense for you against your own enthusiasm.

Conservatism is caution without timidity; a respect for experience without a feeling that nothing good remains to be discovered; a demand that proof be submitted, accompanied by a hope that proof *can* be submitted.

It is not incompatible with this brand of conservatism that the banker in looking at the aviaton ensemble today should revert to the time-honored credit factors as the basis of his criterion—character, capacity, capital.

Character First Essential

A corporation, an industry, has not a soul but it certainly has a character. What are the intangibles that give character to aviation today? Are they not a blend of courage and daring, tenacity and hope, ambition and vision? All these are the characteristics of the pioneer. But just as the pioneer settler in a desert country could never achieve the success of his brother who, though possessing no greater qualities, settled in fertile and well watered lands, so the aviation industry, however superb its character, cannot achieve success without a right start.

I feel that it is proper that the right start should be given by a certain measure of Federal Government control. This will first of all take the form of licensing of pilots and aircraft; then Federal, State and Municipal governmental co-operation in establishment of airways; and later we may work out an acceptable scheme of Government subsidies for operating companies. Given this foundation the next essential is public confidence—that means not only a willingness to use aircraft for passenger and freight transport but willingness to contribute capital. You will come then to your banker with a business character that has the stamp of Government and public approval.

Now as to the capacity in general of the management of the aviation industry. We have no standard of success in the operation of air lines on which to base an estimate of your capacity, for the very simple reason that so far as is known no air transportation companies can yet show an operating profit. The great thing to be accomplished, then, is the demonstration of a capacity to earn dividends. Familiar as I am with the splendid personnel of the industry I lack no confidence in the ultimate "submission of proof" on this point. The progress along these lines cannot be unattended with most of the ills characterizing a period of deflation. Aviation is suffering from a heavy load of overhead and excessive operating costs inherited from the war. The pruning knife of economy must be wielded ruthlesaly if management is to have half a chance to demonstrate its inherent efficiency.

How the Banker Can Help

How can bankers and the general public help you build on your three C's of credit? Bearing in mind your dual role as a factor in national defense and national commerce, they should use their influence to obtain for you a proper measure of Governmental assistance; realizing the vital need for maintaining a high morale in aviation they should decry the continuation of flying circuses and country fair exhibitions which lower the public esteem for the industry as a whole; studying your progress with conservative but open minds, bankers should prepare themselves to advise their clients who may consider contributing capital for your proper enterprises, and finally, when you have established yourself as a "going concern," when you have become like a commercial bank an instrumentality of commerce, undoubtedly bankers will be prepared to finance your current needs and to use your facilities for the better accomplishment of their own functions in the economic life of the nation.

Flying Boat Transportation

By Charles F. Redden

There is going on in the United States a very notable development in airline transportation. And, though slow and not at all spectacular, this development on the whole rests upon a firmer foundation and is more self-reliant than most of the much advertised European undertakings. I refer to the development of flying boat transportation.

The primary reason therefor is historical. For all of Europe—England included—the aerial aspect of the war was an overland proposition, purely and simply. To us, on the other hand, the war was chiefly a matter of seagoing transportation. Our needs were different from Europe's. And so we developed a supremacy of our own in our particular field.

We may grant that in matters of technical refinement the European land planes are perhaps superior to our own, but who can gainsay the fact that no country surpasses or even approaches us in the reliability, comfort and seaworthiness of our flying boats. And I believe that it is through the seaplane and over-water travel that the foundations of American aerial transportation are to be laid.

Land vs. Sea Air Transport

We must go about the business of learning to operate air-lines, in this country, just as we had to learn how to run railroads, or to supply a network of highways for our motor cars. We cannot afford to rush headlong into a new undertaking to find out later whether we come out on top or not, as we did under stress of necessity with steamship exploitation. Capital is naturally cautious. It has to be shown where the dividends are to come from, and is unwilling to expend itself in the establishment of a huge organization without preliminary investigation and development, such as is now taking place. For it should not be believed that the maintenance of an overland airline is merely a matter of ships and motors and terminal fields. It means a highly trained and efficient organization and a vast expenditure for preliminary and permanent ground work. It means the maintaining and supervision of a large number of emergency fields, of signals, of huge buildings; finally it means the running of a small scale city transportation line to bring the passengers and the freight to the distant terminals. All this costs money, and plenty of it. And note that no bona fide line can afford to start *without* all this preparation under penalty of suffering some heavy accident at the very outset and thereby losing public confidence.

On the other hand, consider the flying boat. Look at a map and think of the possibilities offered by our 11000 miles of coastline, including the Great Lakes and our enormous inland river development. All our large cities, from Portland to Galveston, from Seattle to San Diego and from Buffalo to New Orleans are located upon it. And in nearly every case a flying boat can land *almost at the very heart of the business district* without a cent of expenditure for real estate. Seaplane landing fields are literally unlimited, both in number and extent. The business man, or the tourist, or the case of goods can be landed right at the foot of "main street," and what is highly important, the fact of the line's existence is thereby constantly held before the eye of the public.

This last aspect is very essential. It is conceded that the American public must be "sold" on the idea of air transportation. And it is an axiom that in order to "sell" any product to the public that product must be brought to their attention, constantly and by actual demonstrations.

Proof by Performance

We have concentrated upon establishing a record for safety and reliability in our present operations. It is only by an actual show of promise performed that the tide of public opinion can be overcome, and be made to work with you. In the two months between July 17 and Sept. 17, 1,839 passengers were carried between Cleveland and Detroit, which involved 222 crossings of Lake Erie, not to speak of 52 additional charter and sightseeing trips. Over one ton of freight was also carried including a dismantled Ford car. The sightseeing service down New York bay is proving so popular that within eight days in September 101 trips were made, the majority on Saturdays and Sundays.

During the past three years we have flown over 1,000,000 passenger miles; carried over 15,000 passengers and without a single mishap.

Our experience has proven to our satisfaction that the country is ready for seaplane transportation, and that business is here, plenty of it, and that it is worth the effort of going after it.

Analysis of the Proposed Contract Air Mail Route Between Chicago and New York

By C. G. Peterson

The broad classification of commercial aviation is aviation that is not for military or naval purposes. We can then sub-divide commercial aviation into three general headings: Planes owned and operated by private individuals for sporting purposes and for travel; planes owned by companies for sight-seeing and industrial work including mapping, photography, or forestry patrol, and planes owned and operated by companies for transportation purposes including the transportation of passengers, express matter or mail.

I will endeavor to point out why it is our belief that the large volume of commercial aviation will fall into the last class of transportation, that

Map of the United States showing the District organization of the National Aeronautic Association

is mail, and show why mail-carrying will be the first step in establishing successful and dependable transportation lines.

The field for individual ownership will be more or less restricted for several reasons. The expense of operating a plane in addition to its first cost, the difficulty for an individual of obtaining adequate landing facilities, and the comparatively short life and low resale value of present day planes. It is appreciated when one leaves the crowded eastern seaboard that landing fields become more numerous particularly between the Mississippi and the Rockies. It is also appreciated that already some prominent yachtsmen have bought new planes and have operated them during the past summer for their own convenience and pleasure. Nevertheless, it is hard to visualize an extensive use of planes by individual owners.

The next classification of commercial aviation is the operation of planes by companies for various industries. This field is broadening out constantly. Map making from airplanes has proved exceedingly successful. A number of large contracts for map making have been placed by municipalities, railroads, and real estate corporations. This classification should also include compnies which carry passengers for sight-seeing and the

Benjamin F. Castle, treasurer, National Aeronautic Association

Howard E. Coffin, president, National Aeronautic Association

B. H. Mulvihill, vice president of the National Aeronautic Association

class of flying known as "beach hopping" or "joyriding". This whole classification will increase gradually in some phases as the supply of war built planes which can be purchased at a low price decreases. But commercial aviation falling in this category is not what Americans are looking forward to as the large field for commercial aviation.

The Big Field in Air Transport

Transportation of passengers, express, and mail is where most Americans look for the broad field for commercial aeronautics. Carrying passengers, perhaps, comes first to the minds of all who think of transportation by air. There are several serious difficulties to be overcome before the transportation of passengers can be made successful. These difficulties in passenger carrying may be briefly summarized in the high rates which must be paid by the passengers, the difficulty of obtaining proper landing fields near the center of population of the larger cities, the educational work needed in inducing the public at large to make use of the inter-city lines even if such are established, the high risk of liability on passengers, and the difficulty in finding routes which can be operated properly throughout the entire year. Splendid examples of pioneer work on passenger transportation have been shown in the Cleveland-Detroit line, the Key West-Havana line, and lines operated from Florida to Bermuda. But it will be noted that most of these lines have been operated over selected water routes and for one season of the year only. It has been found abroad practically impossible to operate passenger lines without a government subsidy. American aviators do not desire a subsidy, nor, as I will point out, is a subsidy necessary for successful commercial aviation in the United States. The express business, undoubtedly, will eventually make use of transportation by air just as soon as such aerial transportation lines are in successful operation. But it cannot be expected that the express companies can finance such lines or give definite guarantees of the quantity of express matter that will be shipped, and without such guarantees a line cannot be initiated.

The Benefits to Be Derived

Now, let us look at the benefits to be derived by carrying mail by air, the cost, and how this cost will be spread thinly over millions of business men and women of the country. Very few of us realize the quantity of mail that passes daily between the large cities. There are approximately 25 tons of first class mail sent daily from New York to Chicago. This includes the gateway mail at each end and considerable other mail matter, in addition to letters. There are on an average of 160,000 letters a day collected in New York City for delivery in Chicago City. This quantity does not include gateway mail at either end. The quantity of gateway mail is several times this amount. There are approximately 325,000 letters a day sent from Chicago to New York for delivery in New York City. The figures given are for letters and first-class mail and do not include other classes of mail of which there is a tremendous volume.

It must be remembered when one figures carrying on mail by air that the length of the route must be sufficient to offset the loss of time in transit from the Post Office to the flying field at both ends of the route. Also that the heavy mail is collected at the close of the business day and that there is little advantage in considering carrying mail by air between the cities situated so closely together that mail leaving by train at, say after 8 o'clock in the evening, will arrive at its destination for early distribution the next morning. We must therefore look to long distance routes such as New York to Chicago, for instance, in order to take full advantage of the time saved.

Fly By Night Throughout Year

Now, as to how it will be possible to have dependable service for night flying. We believe that the following plan, carefully worked out in detail, will make night flying throughout the year possible. We have prepared cost estimates of this proposed plan and the cost is not as high as one might imagine. On a route from New York to Chicago the contractor must be able to get from the government a contract for a reasonable period of time such as the four year period now given on mail star routes. This four year contract period will enable the contractor to lease and prepare suitable landing facilities at the terminal cities and the divisional points, and to provide adequate planes and aids to navigation.

The distance by air is approximately 780 miles. The route would be divided into three divisions, and the mail changed to a fresh plane fully serviced with a fresh pilot at each divisional point. The divisional fields would be equipped with storage hangars and work shops. Between the divisional points emergency landing fields would be leased by the contractor and maintained in a usable condition for emergencies. These would be from 15 to 25 miles apart or within possible gliding distance if a 5,000 ft. altitude was maintained.

A series of powerful Beacon lights would be established along the entire route including exceedingly large lights at the terminal fields and somewhat smaller, but still very powerful Beacon lights, at each of the emergency landing fields. All of the fields would be illuminated by a series of flood lights or indicator lights which would show the pilot where to make a landing, the direction and velocity of the wind, and the limits of the field. It would not be necessary for these lights to burn steadily all night long, several methods of switching them on and off automatically or semi-automatically, having been considered. With this system of illumination it will be possible for a pilot under average weather conditions to always be able to steer his course visually by following the Beacon lights.

In Constant Radio Communication

It is realized that in fog and under stormy weather conditions the range of visibility will be greatly decreased. For this reason we have figured on the contractor installing in each plane a radio telephone receiving set and a radio telegraph sending set. We have figured on establishing a radio compass station at each terminal and division field and at one field midway between the division points, in other words, about every 125 miles. The telegraph sending set in the plane would be fitted with an automatic sender which would send out the code number of the plane at regular intervals of say every 3 minutes. The compass stations between which the plane was flying would receive these automatic signals and keep tally of the location and course of the plane. If the pilot found or believed he was off the course he would move his automatic sender to ask the compass station for the proper bearing to get back on his course. He would receive their reply by telephone. This system of using an automatic telegraph sender and receiving by telephone will enable the pilot to get the full use of his radio gear without distracting his attention from piloting his ship.

We have figured on the contractor using new modern planes which will carry at least 1,000 lb. of mail, with a cruising speed of 100 m.p.h., and a high speed of 20 to 25 miles faster. We estimate that the cost of operating this service, based on a four years' contract, flying four planes Eastbound and four planes Westbound daily will be approximately $1,863,000 per year. The four Eastbound planes will expedite 210,000 letters a day, and the four Westbound planes another 210,000 letters a day, or saving a business day on 420,000 letters a day. Flying on 310 business days a year would mean 130,000,000 letters per year, and the cost would be less than 1½ cents per letter. This works out that the total cost per mile flown is about $1.00, which is at the rate of one mill per mile per pound.

These figures show that for less than $1,000,000 a year approximately 50,000,000 letters could be accelerated one business day. The yearly deficit of the Post Office Department is considerably over $100,000,000, thus, for less than 1 per cent of the yearly cost of the Post Office Departmnt it is possible to save a whole business day on 50,000,000 letters. Surely the advantage to the business community in such an acceleration is worthwhile.

Passenger Traffic Natural Growth

We have based our figures on a route from New York to Chicago, believing that such a route should be the first one to be established, and further believing when such a line is established and successfully operated for a sufficient period of time to demonstrate its feasibility that extensions will be rapidly made and additional trunk lines established. These trunk lines once established and successfully operated will prove such a boon to the commercial communities of the cities, both at the terminals and

along the route, that after they have been in operation for a fair period the communities would never allow them to be discontinued. The service will grow and gradually expand to carrying express matter. Then, from time to time, when the general public realizes the punctuality and reliability of the service they will seek the expansion of the line for passenger traffic. But this passenger traffic will be a natural growth for those whose time is so valuable that they can afford the additional cost of aerial transportation, and the sales expense in obtaining such passengers will be a reasonable percentage of the gross receipts.

Aeronautical Legal Problems

By William P. MacCracken, Jr.

There are three legal questions which the business man about to invest in an aeronautical enterprise wants to have answered:

First: What are an aeronaut's rights?

Second: What are an aeronaut's liabilities?

Third: What governmental agencies have power to regulate aeronautics, and to what extent?

These questions are so interrelated that they will not be considered separately. "What are an aeronaut's rights?" may, in turn, be divided so as to present several different rights, such as his right to compensation for passengers and freight carried, or for services performed; his right to recover for injuries attributable to the negligence of another aeronaut, or the negligence of the manufacturer of his aircraft, but the question which is of primary importance involves his right to fly through space over property of another, and it is this particular right which presents the most serious legal problem.

Those who challenge an aeronaut's right to fly over another's property rely upon the common law maxim which states that the owner of the soil owns to the sky.

It was handed down from the Roman law. A literal application of this maxim would prove a most serious handicap to commercial aeronautics. So far, it has not been passed upon by any court of last resort in this country in a case involving flight by aircraft.

In determining whether or not this maxim should be modified or construed so as to permit flying over another's property without the owner's consent, the question should first be approached from the point of view of the property owner. His land would not be damaged by permitting aircraft to fly over it any more than it is damaged by permitting automobiles to pass in front of it along the public highway, nor would the owner's use of the land be affected, if the right of passage of aircraft was limited to a height sufficient not to interfere with the owner's use of his property.

Considered from the standpoint of public convenience and necessity no argument is needed in support of a modification of this theory of property rights in air space.

Right to Fly Over Another's Land

Public opinion would seem to support this contention when one considers that during the years 1920 and 1921 aircraft traveled approximately 12,000,000 miles in the United States without any single property owner presenting a claim for aerial trespass. This year in the State of Pennsylvania a complaint charging aerial trespass was filed against the "Windy" Smith Flyers before a Justice of the Peace. It conceded on the trial that the defendants had flown over the complainant's land at a height of 300 ft.; they were fined in the Justice's Court, but on appeal this judgment was reversed. From the judgment of reversal an appeal has been taken which is still pending.

Several of the writers on this subject have suggested various methods by which this right of flight could be acquired in the event the courts should hold that it did not exist at common low. Judge Lamb, former solicitor for the Department of Commerce, has suggested a statutory condemnation by Act of Congress of all the air space over privately owned property, giving the owners a right of action against the United States for any actual damage they might be able to prove. As it would be impossible to prove actual damages, the net result would be that the right would be acquired without expense to the government. Major Johnson, legal advisor to the Chief of Air Service U. S. A., has suggested that the right be acquired by a federal constitutional amendment.

The conference of Commissioners on Uniform State Laws in their draft of the Uniform State Aviation Act adopted at San Francisco Aug. 7, 1922, make the following declarations:

> "Section 3 (Ownership of Space). The ownership of the space above the lands and waters of this state is declared to be vested in the several owners of the surfaces beneath subject to the right of flight described in Section 4.
>
> Section 4 (Lawfulness of Flight). Flight in aircraft over the lands and waters of this state is lawful unless at such a low altitude as to interfere with the existing use to which the land or water or the space over the land or water is put by the owner, or unless so conducted as to be imminently dangerous to persons or property lawfully on the land or water beneath."

Aviator's Liability for Damage

There are many more phases to the question of an aeronaut's liabilities than there are to the question of his rights. First of all, there is his liability for damage to property and injury to persons upon the ground. Next, there is his liability to his passengers, or to the owner of the goods transported by him. There is also his liability to his employes, and finally, his liability to other aeronauts.

The laws thus far enacted by the various state legislatures have not been uniform in fixing the rule of liability but the Uniform Aviation Act as approved by the Commissioners on Uniform State Laws provides:

> "Section 5. (Damage on land). The owner of every aircraft which is operated over the lands or waters of this State is absolutely liable for injuries to persons or property on the land or water beneath, caused by the ascent, descent or flight of the aircraft, or the dropping or falling of any object therefrom, whether such owner was negligent or not, unless the injury is caused in whole or in part by the negligence of the person injured, or of the owner or bailee of the property injured. If the aircraft is leased at the time of the injury to person or property, both owner and lessee shall be liable and they may be sued jointly or either or both of them may be sued separately. An *aeronaut* who is not the owner or lessee shall be liable only for the consequences of his own negligence. The injured person, shall have a lien on the aircraft causing the injury to the extent of the damage caused by the aircraft or objects falling from it."

In support of this high degree of liability its proponents rely upon the difficulty of proving negligence and the inability of the injured party to protect himself or his property.

Compensation for Injuries

Compensation for injuries suffered by employes will undoubtedly be covered by amendments to the Workmen's Compensation Acts in the various states where these acts are not already broad enough in their scope to cover individuals employed in aerial transportation.

Until aerial navigation is more a matter of common experience, it will be difficult for courts to determine what constitutes negligence and what risk can be regarded as having been assumed.

These same problems are involved in determining the liability of one aeronaut to another. Collisions in the air have not been numerous, and unless attributable to weather conditions such as fog or the negligence of one or both pilots in stunting, it is almost impossible to determine with any degree of certainty which pilot was at fault.

Governmental Regulation of Aeronautics

Governmental regulation of aeronautics presents a most interesting legal problem. As heretofore pointed out state legislatures have already enacted some regulatory legislation; in California, Connecticut, Kansas, Oregon and Maine the acts are fairly comprehensive, while in New Jersey, Minnesota, Indiana, Montana, North Carolina and Utah the scope of the legislation is very limited, dealing only with such subjects as the use of airplanes in hunting and the acquisition of aviation fields by condemnation or otherwise. New Jersey and Minnesota prohibit flying in certain localities at altitudes of less than 2000 ft.

Numerous city councils acting under the police power have adopted ordinances regulating aerial navigation in the air space within their respective city limits. Their validity is yet to be tested in the courts. In the meantime Congress has failed to pass any law on this important subject, notwithstanding the fact that several bills have been introduced at each session during the last four years and the aeronautical interests have exerted their influence to obtain some federal legislation on the subject. So far the controversy has hinged upon the extent of the Federal Government's power to regulate aeronautics in all of the space over the United States, its territories and the territorial waters adjacent thereto. For a time there was some question as to whether or not sovereignty of the air over any country in time of peace would be recognized by international law. But the development and importance of aeronautics during the World War made necessary the recognition:

> "(1) of the principle of the full and absolute sovereignty of each state over the air above its territory and territorial waters, carrying with it the right of exclusion of foreign aircraft; (2) of the right of each state to impose its jurisdiction over the air above its territory and territorial waters"

as adopted by the International Air Navigation Convention, which was held in conjunction with the Peace Conference.

As previously noted, a constitutional amendment vesting in the federal government power to regulate the use for air travel of all space over the United States has been suggested. However, the American Bar Association at its meeting in Aug., 1922, adopted a recommendation

> "That until Congress has enacted legislation fostering and regulating aeronautics and until the Supreme Court has determined the extent of federal control over aeronautics no further consideration be given to the question of a constitutional amendment to vest exclusive jurisdiction over aeronautics in the federal government."

The bills which have been introduced in Congress have been drafted under one or more of the following clauses of the federal constitution: The interstate commerce clause; the treaty making clause; the admiralty clause; the post roads clause; the national defnse clause and the clause granting jurisdiction over limited areas acquired or purchased from the various states.

While all of these clauses may be helpful in reaching the conclusion that Congress may assume for all practical purposes exclusive jurisdiction over the regulation of aeronautics, undoubtedly the greatest power comes from the grant contained in the intrastate commerce clause and the treaty making clause. To exercise the latter requires the ratification of a treaty with some foreign country which would make necessary federal legislation on the subject of interstate aerial navigation. While such a treaty will undoubtedly be ratified in the course of time, there is no such treaty now in existence and therefore the most logical procedure would be the exercise of the power under the interstate commerce clause.

Uniform Regulation Indispensable

Uniform regulation of aeronautics is admittedly not only desirable but absolutely indispensable to the effective development of aerial transportation as an instrumentality of interstate commerce. It therefore seems reasonable to believe that legislation for the regulation of aeronautics by the Federal Government would be sustained as constitutional, notwithstanding the fact that its scope would be broad enough to regulate both inter- and intrastate aerial navigation.

It has also been suggested that Congress in the exercise of its power to regulate interstate and foreign commerce could require corporations engaging in interstate or foreign aerial navigation to be incorporated under a federal incorporation law. If this suggested legislation is enacted, Congress could confer upon the federal courts exclusive jurisdiction of suits brought by or against such corporations.

It would therefore appear that the regulation of aerial navigation will ultimately be either largely or exclusively vested in the federal government and any authority which may remain in the several states will be so limited in its extent that its exercise will not seriously interfere with the development of aerial aeronautics.

Commercial Air Transport - The Next Step

By J. Rowland Bibbins

Air transport, like highway transport, has come, within very recent time, to have a practical meaning which now challenges American business. America is a speed-loving nation.

It is a land of magnificent distances—a long-haul country which has staked its prosperity and future on high speed, low cost transportation. The welfare of the great interior depends upon this—an interior of immense production and population, but several times farther from seaboard than any other country of great production and population. Conversely, America's position in the competitive markets of the world will ultimately revolve about her ability to develop long-haul transport at minimum cost, while maintaining the American standard for her people.

Time is a very large factor in business—most important to transport of people, commercial documents and high value freight; least important

in commodity movement where quantity rather than speed becomes the essence of low transport cost. In our transportation development the insistent note has been speed, more speed: first, waterways, then stage lines, single-track railroads, and now four-track roads with extra fare preferential train movements; likewise city horse cars, then trolleys and high-speed subways; horse-drawn vehicles, then the automobiles and motor truck. This is all significant, because there is a business reason.

The Cost Factor

The American nation is now spending for transportation about $100 per capita per year, far more than the whole pre-war national debt, and nearly half the present national debt. If all business transactions could be done at one place and time there would be no need for long-haul transport. But during the year, commerce requires a movement of 50,000,000,000 passenger miles and 500,000,000,000 ton miles on the railroads alone, neglecting entirely the enormous movement, yet uncharted, of 10,500,000 motor vehicles.

The Time Factor

Outside of the actual transport cost, a great and unknown cost is the time element in the transaction of business, not only of personnel, but of mail, specie, securities, bank clearings, and urgent merchandise, as well as less valuable and urgent freight and express. Every added hour or even minute in transit adds to the cost of doing business, in personnel, interest carrying charges, additional equipment needed in transport, and additional working capital assets of business. This conception is not visionary, it is an actuality, and has given rise to various methods and agencies for expediting business, for which service additional rates are paid, and paid gladly. Here is an open field—and a fair field—for air transport.

But each transport system has its limitations, first as to the highway it uses, and second as to the equipment it has to provide. Only the seven seas and the air above are the *open roads* to commerce, subject to practically no capacity restrictions. There will always be slow freights and fast freights as passenger trains on the railroads. But provision for both has required billions of extra capital for a four track road bed. The same restriction is coming to be felt acutely in highways. Water and air are still the open roads. But they, too, must be subject to certain regulations for the good of all. They, too, must have well organized and equipped terminals. They, too, must dispatch, control and safeguard their "floating equipment" according to modern methods, to fulfill the exacting demands of commerce and industry.

American business is organized upon the fundamental principle of private enterprise and it looks at commercial aeronautics from this viewpoint, at the same time recognizing fully the inestimable value of the development work accomplished by the Government. But it also demands that a stable foundation be laid for the future so that air transport will gradually take its place in the National Transportation plan as the prime agency for speed and expedition. And it extends the restraining hand for the one and only purpose of taking full advantage of past experience with other transport systems, thus avoiding the hazards, the huge dissipation of capital, discouragement of effort, bad planning of air lines and terminals, which misfortunes would be certain to result from a development unguided and uncontrolled.

This whole subject has enlisted the attention of no less a national body than the Chamber of Commerce of the United States, a federation of over 1,400 principal trade and commerce organizations, with an underlying membership of over 700,000 businessmen throughout the country. Upon suggestion by resolution of one of its organization members, the National Underwriters Association, the Transportation Department of the Chamber, after some investigation, was authorized to lend its support in the initial steps which are clearly necessary to secure both present and ultimate stability in the air transport industry, and to secure the continued sympathy of business men in its undertakings.

Some Important Principles

The principles developed in this study are as simple as they seem important.

1—*The immediate support of basic national legislation on aeronautics* providing for appropriate regulatory procedure.

2—*Such legislation to be broadly conceived*, in the nature of an enabling act providing for the adoption, administration, and improvement from time to time of an Aeronautical Code under proper Government authorization created by the Act.

3—*Adequate facilities within the Department of Commerce* for promoting the regulation and development of commercial air transport operations in interstate and foreign commerce.

4—*Intra-state legislation and operations* to conform as nearly as possible to the basic Federal legislation, or at least unified State action.

5—*Encouragement of widespread public support* of this essential aeronautical legislation.

These principles received the sanction of the Advisory Committee of the Department of Transportation and Communication numbering among its members prominent railroad, motor, utility, shipping, banking, and terminal executives and consulting engineers, and were duly presented to members of Congress concerned in aeronautics.

The aeronautic industry is the only important case on record of a new industry asking to be regulated from the inception of its operations. We have the Transportation Act, Public Utility Acts, Merchant Marine Act, and 47 varieties of State Highway Acts, all of which have been developed *under public pressure* for the regulation of these transport agencies. The aeronautic industry, however, invites it, realizing that the success of air transport is bound up with, and vitally depends upon the promulgation of an efficient code of rules and regulations under which flying would be rendered easier and safer, rsponsibility between carriers and traffic would be definitely fixed, and the conditions under which national and international business must be transacted would be known to all parties concerned. Such an aerial code is an absolute necessity for commercial aviation.

The United States is the only large western nation participating in the European war which has not such a code. Canada has a complete code patterned after, but modified from the much used International Code brought down from the League of Nations. At the present United States flyers are only permitted in Canada through international courtesy. However, a U. S. code is nearing a practicable stage, and only awaits enabling legislation.

The Second Step—Ground Organization

What is more important now is the *next* practical step, looking beyond the establishment of a practical and sympathetic system of regulation. It is suggested, that the air transport industry direct its attention with the utmost care and concerted effort on that great essential organization, which for lack of a better term we may call *ground organization*.

1—Co-operation of districts and localities in providing properly equipped air harbors and intermediary air lanes, under unified federal control.

2—Co-operation of the Government along certain lines of national aerologic and radio broadcasting service.

3—Adequate motor collection and delivery system between air ports and the business centers.

4—Temporary continuance of the valuable pioneer development work of the Air Mail until substantial realization of above essentials permits of private enterprise.

There seems little or no possibility of adequate and prompt development without co-ordinating the several states, dozens of cities, and the Federal services, in providing chains of landing fields or air ports, both municipal and emergency, with suitable repair and supply facilities, also adequate demarkation day and night of cross-country air ways between these fields with radio signalling and control equipment between land and ship or plane for dispatching and especially to permit night and storm flying.

Further, it may be found desirable to lay out air ways with special reference to contacts with highways and railways for the purpose of quick inter-field movement for supplies, assistance, etc. This may help to develop a useful relay or expediting speed service along the transcontinental rail routes.

Importance of Terminals

Unified terminal development and administration is of special significance. We are planning a high speed transportation system superimposed upon the existing rail, water and highway systems. Each, as in the past, will require terminal facilities of continually expanding capacity. There will always be the gateways, the "neck of the bottle," through which all traffic must pass. And here past experience must be taken advantage of, for it is recognized today that the terminal burden in investment, operation, delay and cost of transit represents a very large proportion of the transportation cost from point of origin to ultimate point of destination.

The Status of Aircraft Insurance

By Edmund Ely

The history of Aircraft Insurance up to the present time is merely a record of preparation. Insurance against one or more aerial hazards has been available from the time of the earliest practicable airplanes but, as the war provided a greater stimulus to their manufacture and use, from that time dates the real development of Aircraft Insurance. At one time or another since the war no less than twelve companies have been actively engaged in underwriting aircraft risks. During that period any two of the companies could easily have handled all of the business that was available, and I believe it has been the aim of the companies to gain a knowledge of the business and to build up experience which will serve as a guide when the increased use of airplanes demands increased insurance facilities.

The primary interest of all concerned in this development is the safety of flight and this can be accomplished generally only through federal supervision. So much has been said about the urgent necessity for federal regulation and control that it is unlikely that more words can be of any avail in obtaining action and yet it may be of some interest to present the insurance viewpoint.

Basic Law Is Needed

Two kinds of legislative action are required of the Government in dealing with aviation: (1) providing a basic law fixing the status of aircraft and setting forth the rights, duties and limitations of owners and operators; (2) providing the outline for general regulations which shall apply uniformly within federal jurisdiction and creating the machinery for the enforcement of such control.

The insurance business feels this lack perhaps more keenly than any collateral line of the aircraft industry. At the present time if an insurance company assumes the liability of an operator for damage to persons or property it has not only to estimate the probability of the event resulting in such damage but it is also at a loss to know what legal principles and jurisdiction will apply in fixing the degree of liability. Such experience as the companies have gathered has shown conclusively that the hazards of aircraft operation are largely controllable, and the absence of suitable and uniform supervision is without question responsible for many accidents. If such regulation and control were existent at the present time there is no doubt that insurance could be undertaken at materially lower rates with a reasonable expectation of the result being favorable.

Insurance Register of Pilots

In order to fulfill their own requirements and pending the enactment of such legislation, the insurance companies have done what they could to supply the deficiency. At the request of the National Aircraft Underwriters' Association the organization known as Underwriters Laboratories, Inc. of Chicago, Ill., which was established by the Fire Insurance companies, undertook a comprehensive program to secure safety of flight. The plan contemplates three essential features:

1—A register of pilots;
2—A register of ships;
3—Certificates of airworthiness.

The register of pilots involves the following:

1—An application form filled out by the pilot seeking registration, giving full data as to his training and subsequent flying experience.
2—A physician's statement of surgical and medical examination.
3—A certificate of registration to applicants found qualified.
4—A system of bulletins to Association members announcing the filing of applications, action thereon and cancellation of registry.
5—A board of inquiry to consider crashes.
6—Publication of rules of the air covering the pilot's conduct and responsibilities.

The certificate of registration expires after twelve months, and previously if the pilot is inactive in flying for 120 days. It may be cancelled or suspended at any time for cause and is automatically suspended upon inquiry following a crash involving insurance.

Based on International Convention

The plan is based upon the provisions of the Convention Relating to International Air Navigation agreed upon, subject to certain reservations, by the representatives of the allied and associated powers serving on the International Commission on Aerial Navigation, which was constituted as a sub-commission of the Peace Conference. It follows very closely the air regulations of the Canadian Air Board. Approximately 25 pilots are now registered; in addition to these, registration has been refused to 4 others and one registration has been cancelled.

The identification or marking of commercial or private aircraft should be of increasing importance to various interests. The plan is similar in essentials to that of the Canadian Air Board, Lloyds Aviation Register

and the International Aircraft Convention of the Peace Conference. A total of thirty aircraft are now registered, of which eight are private. One registered ship crashed and its registry was cancelled.

The airworthiness inspection program of Underwriters Laboratories involves detailed inspection of the ship and the certification of its safe condition for flying. To date four ships have been inspected for airworthiness and certified. Several certificates are held in suspense pending maintenance, improvement, and essential repair work, and the certificate of airworthiness has been refused in other instances.

As an instance of the value of this service, a transcontinental air tour was undertaken some time ago in a machine which was in such poor condition that Major Schroeder of Underwriters Laboratories had declined to certify to the airworthiness of the ship shortly before the tour was begun. The ship crashed, fortunately without loss of life.

Had the aircraft industry energetically supported this inspection program it would then have transpired either that the proposed tour would have been abandoned or a certified ship selected, and the undesirable advertising given by the public announcement of the crash could then have been avoided.

Most Accidents Preventable

Statistics of insurance companies are necessarily limited. We have, however, sufficient data to lead us to the conclusion that by far the largest number of losses is avoidable. Our figures show that 76 per cent of the accidents are due to collision of the plane with the earth or some other object and that of these collisions 64.4 per cent were avoidable. In making this division we have given operators the benefit of every reasonable doubt and no clearer indication can be had of the necessity for regulation of flying.

Fundamentals of Commercial Flying - Review of Developments in Europe

By Prof. E. P. Warner

The major operations now furnishing on a relatively small scale data later to be applied to the commercial use of aircraft on a large scale are those of the United States Air Mail and of the various European air lines. Since my recent experience has been with the European undertakings I shall base this discussion particularly on their experience and present practices, but it would be unjust to turn to a consideration of aeronautical enterprise across the sea without allusion to the fallacious nature of the common belief that America lags far behind the Eastern hemisphere in all aspects of commercial flying. As a matter of fact, the airplane mileage of the Air Mail during the last year for which statistics are available was almost exactly equal to the total distance flown commercially in England and France combined, while the safety record made since the summer of 1921 on the New York-San Francisco route has never been approached anywhere else in the world.

Notwithstanding all this, however, the very fact that the Air Mail is operated by the government and that it uses entirely rebuilt army flying equipment makes it in some ways unsatisfactory as a basis of calculation, and its operations should be studied in conjunction with those of private enterprises.

Functions of Privately-Operated Air Service

It is often stated, usually without concrete evidence to back the statement, that commercial flying depends solely on governmental subsidy and that without the subsidy it would inevitably perish. This is unfortunately true of some undertakings, although not by any means of all, and in the degree in which it is true it of course represents the existence of a belief that the importance of commercial flying to the state is so great that the citizens should be willing to bear taxes for its maintenance as a contribution to the common good.

An analysis of the subsidy question should begin with France, as the subsidy law there is the oldest and the most generous in the world. The total allotment for aeronautical subsidies in the French budget of 1921 was $3,500,000 in round figures at present exchange rates, while Great Britain devoted only $900,000 to the same purpose. The German grant was about $200,000, but monetary comparisons involving the mark are meaningless in the present state of German finance. The recent report on the aeronautical section of the French budget for 1922 has shown that the total receipts under the subsidy during the first six months of 1921 were 13,858,310 francs, while the same companies received for the carriage of passengers and express during the same period a total of 1,577,434 francs, the ratio between the two figures being 8.8 to 1. During the whole of the preceding year the ratio had been only 5.04 to 1. In the case of one company, that operating from Toulouse to Morocco, the ratio was 17.5 to 1, and the subsidy received in that instance did not include any grant specifically destined for the purchase of new machines.

Notwithstanding the seemingly generous proportions of the government grant, however, that particular company ran at a slight financial loss during the first half of 1921, the ordinary receipts from traffic amounting to less than four per cent of the operating expenses. The line to Morocco, already cited, carried during the same six months' period under consideration an average cargo of .05 of a paying passenger, 38 lb. of express, and 6 lb. of mail per trip, a total average pay load of 54 lb. In 1920 the figure was 58 lb. No transportation enterprise of any sort could run successfully with such public support as that, and it can only be kept operating by a subsidy sufficient to meet all the expenses, the receipts from the traffic being negligible.

Some lines, thanks to a more favorable location, have attracted real public support. During the summer of 1921 the average load of a cross-Channel airplane was 3.56 passengers and roughly 30 lb. of express, and the average number of passengers for the British lines alone was 5.97, a pay load, with allowance for the normal amount of baggage, of nearly 1,200 lb. per machine.

It All Rests on Public Support

Since there is such disparity between the performances of different lines, and since it is impossible to plan to build a commercial structure on subsidies alone, the crux of the whole matter is seen to lie in public support.

The cost is not a serious item in most cases. Although travel by airplane is more expensive than by train, the cost of air transport is not enough different from that of first-class European railway travel for it to be a deciding factor for the well-to-do. Services are being operated regularly by French companies at 8c. per passenger mile, and the history of three years of operation in Europe indicates that air lines can be run profitably at a rate of from 12c. to 15c. per passenger mile and without subsidy if the traffic to fill the machines comes forward at that price.

Present operating costs can be reduced either by improvement in equipment or by increasing the ratio of pay load carried to possible capacity or by improving the efficiency with which existing equipment is operated. The second of these possibilities is the major point under discussion in this paper, but the third should also receive some attention. As an illustration of what can be done in the way of continuous and efficient utilization of standard equipment the record made by the Daimler airways last June is of great interest. During that month the Daimler Company made 84 trips between London and Paris with only one machine in service. The total flying time of the airplane during the month was nearly 200 hr., and on one occasion four trips a day were made for five days without a break. Engines were changed and all repairs were made during the night. At the end of the month the airplane was certified in perfect condition by officials of the Air Ministry, and it had apparently deteriorated no more than it might have done if it had been sitting in the hangar. This is real commercial transport, and shows what can be done with proper equipment carefully maintained. As a contrast it may be mentioned that during the same month another company having about 60 machines in service flew them a total distance only less than twice as great than that of the single airplane just mentioned.

Danger Not So Great As Supposed

The danger of flying is by no means so great as is popularly assumed. The average accident rate on European lines runs very close to one fatality for every 400,000 passenger miles but some lines have done much better than that and at least one company has operated for a distance of 650,000 airplane miles without the loss of a passenger. Nevertheless the danger is greater than it should be, and the situation cannot be considered satisfactory even yet.

Accidents do not happen without reason and they can all be prevented if vigilance is used and if the organization is sufficiently thorough. The air mail in this country, operating regardless of weather conditions, has shown in the past year what can be done by minute and unwearing attention to maintenance. If no chances are taken and if the methods used by the air mail are applied to commercial operation everywhere it should be possible to reduce the accident rate to one-fifth of its present value. It is impossible, however, to hope for a good record for commercial flying as a whole without some measures of government regulation.

Regularity of service, like safety, is largely a matter of attention to detail. In my own experience during the past summer, of the five air journeys of varying length which I undertook only one was completed within half an hour of the scheduled time of arrival, and only two within two hours. Of the other three, one was postponed a day and then finished two hours behind schedule on the second day, while another was never finished at all. The desire to fly in all sorts of weather in order to make a reliability record must not be allowed to place safety in jeopardy but short of that no effort should be spared to carry the flights out in accordance with the original plan. The airplane will not be satisfactory as a vehicle of travel for the ordinary business man until 39 flights out of every 40 scheduled go through without serious delay.

Most Passengers American

Up to the present time, for a variety of reasons, the business man is not using the airplane as much as might be hoped. An official of one of the London-Paris lines informed me that more than 40 per cent of the present traffic was made up of American tourists and I heard a similar story in many other quarters. A French engineer explained to me "It is our belief that Americans have thoroughly acquired the habit of traveling by air." My own experience would certainly indicate that the statistics just cited no not overstate the case, for more than 85 per cent of the passengers with whom I traveled were American tourists.

The next objection that is frequently raised against the air services as now carried out is on the ground of insufficient saving of time to make their use worth-while. The loss of time is chargeable in part to the distance from the cities to their air ports, in part to delays in starting trips. The first difficulty cannot well be overcome in most cities, and the routes selected for exploitation must be long enough so that the saving of time over older methods of travel will make up for the time lost in getting to and from the termini. The second difficulty lies within the provisions of the operating officials to remedy. It is altogether too common on some lines to see a machine brought out of the hangar a few minutes before the time to start the trip, no attention being given to it until the scheduled starting time, after which it sometimes takes an hour to get the engine going properly. The officials in charge of maintenance should know that the engine's condition is as perfect as it can be long before the time has come for the passengers to get on board. Another occasional and irritating cause of delay is found in waiting for connections and for additional passengers. An airplane should run on a schedule like any other common carrier, and the delaying of the start by fifteen minutes because an additional passenger telephones that he is just about to start out from the city should be unthinkable.

Question of Comfort Important

The question of comfort of the passengers is a matter of roominess, ventilation and silence. Very few machines now offend badly in respect of ventilation and ample space in the cabin is available in those of large size. To secure satisfactory cabin accommodations on a two- or three-seater is a much more difficult problem. The noisiness of the airplane engine, however, constitutes an ever-present difficulty, much greater in importance than has generally been realized. It is difficult for an experienced pilot or aeronautical engineer to get the viewpoint of a passenger who has never flown, and the designer is prone to think too much of efficiency and too little of those factors which attract or repel repeated patronage. I have talked with a considerable number of my fellow passengers on the European lines, most of whom had never flown before and a considerable number of whom apparently had no desire to fly again, and in nearly every case where the passengers declared that "once was enough" their antipathy could be traced to the noise, which renders conversation absolutely impossible during the journey in most machines and which leaves some of the inexperienced travelers partially deaf for an hour or more after finishing the trip.

What Steps Must Be Taken

Having listed the main defects of commercial operation at the present time and having to some extent considered the cures together with the ills, it appears that the principal requirements, considered particularly from the American point of view, are:

(1) Government regulation and government assistance in the organization of airways. This is absolutely essential, and it is useless to talk of any real commercial operation except over the water until Congress has acted.

(2) More landing fields near the centers of the cities which they serve.

(3) More careful attention to maintenance. The Air Mail should be taken as a standard to follow in this respect.

(4) More efficient operation. Every airplane should be kept in service

as nearly continuous as possible. Time spent in the hangar is a dead loss.

(5) Stimulation of public interest by circulation of the facts about flying and particularly about its safety.

(6) Improved design. In the case of the engines this means greater life and reliability. In the case of the airplane it means primarily greater attention to the wants of the passenger and more careful study of his point of view.

Question of Commercial Design

The design of commercial airplanes is undoubtedly open to some improvement, but we should avoid the idea that there is anything mysterious about it or that there is some magic in the word "commercial". In the last three years in America we have seen a series of airplanes attract, at least temporarily, the greatest enthusiasm and we have heard the day of true commercial flying heralded with the advent of each new type. As a matter of fact, the difference between commercial and military machine in their possible performance is much less than has often been supposed, and the most important difference resides in the construction and volumetric capacity of the fuselage. An airplane carrying 9 lb./sq. ft. can take off and fly safely, although not with a large reserve of power, with from 18 to 20 lb./hp. This equivalent to a commercial load of from 5 to 6 lb./hp. or approximately one passenger for every 30 or 35 hp. That performance can be realized with cantilever monoplanes, with monoplanes which are not cantilever, or with biplanes braced with wire in the most old-fashioned way. There are many types which are operating successfully in Europe today, and no one of them is showing any tremendous inherent advantage over the rest. We have sought too often in the past to find the successful commercial aircraft through a miracle, through casting away entire the knowledge gained in four years of military design, and we have given too little attention to those minor details which must be studied with the utmost care if success is to be gained.

There is one serious drawback to passenger carrying from the point of view of the business man, and that is the extent of the liability claims in case of a crash. A single bad accident with verdicts such as might be expected from past experience with American courts and juries would be enough to wipe out the profits of years of operation. In Europe the operating companies all require the passenger to agree to a contract whereby he assumes all risk of injury to himself, whether through his own negligence, negligence of the company's servants, defects in equipment, or acts of God. American legal opinions is agreed that no such stipulations by a common carrier would be supported by the courts here. It is therefore natural that other types of traffic not involving the liability hazard should be sought, and of course the most obvious is the carriage of express. The express business is a very promising one, but only if it is run in conjunction with express companies which have the facilities for collection and distribution, thus relieving the company operating the aircraft of this responsibility. Express traffic was ardently sought in Europe during the first two years of commercial flying, but it has recently become less and less popular among the air lines and one or two of the largest ones are refusing it altogether, having found that they were involving themselves in the obligation to make special automobile deliveries covering 20 or 30 miles with half a dozen tiny parcels. That task should be undertaken by those who are already equipped for it and who have no other responsibilities than the handling of express matter on the ground.

Book Review

IMPROVEMENT OF AUTOMOTIVE ENGINES THROUGH PISTON EFFICIENCY. (Vervolkommung der Kraftfahrzeugmotoren durch Leichtmetallkolben). By Prof. Gabriel Becker, director of the automotive experimental laboratory of the Technical Institute, Berlin. (R. Oldenburg, Munich).

In April, 1921, the automotive division of the German traffic ministry in conjunction with the automobile manufacturers' association offered a prize for the best all around design of light-metal pistons. The experiments to determine the winner among the seventeen models submitted were carried out in the automotive laboratory of the Technical Institute at Berlin. The present volume is a discussion of the experiments and the conclusions of the author therefrom.

The first part presents an analysis of the possible improvements to which internal combustion engines are still susceptible with a view of improving their overall efficiency, with special reference to thermal improvement through better utilization of heat distribution and conductively in cylinder walls and pistons. The author preaches the gospel of low temperatures in the induction system and shows that compression ratios of 8 and over are mechanically possible in conjunction 50 per cent thermal efficiency if the pre-compression temperature can be maintained at 25 deg. C. Therein he is decidedly at variance with the majority of American investigators who are facing the problem of vaporization and condensation of present low grade fuel. It is to be regretted that this phase of the subject is not gone into in the present volume.

The second part is devoted to the description of the apparatus used in the tests and the results thereby obtained. The theory of heat conductivity in pistons and connecting rods is fully discussed and possible improvements pointed out. The motors used were Daimler 45 hp. truck motor, with overhead valves and a 10-30 Protos side valve passenger vehicle engine. Thermocouple measurements were taken at ten points on the surface of pistons the latter being clamped in a special furnace duplicating as much as possible the conditions prevailing within a cylinder. Various oils were also experimented upon with a view to their thermal conductivity.

For comparative purposes a cast iron and a pure copper piston were also included in the tests. The pistons under test were graded according to a merit-point system, points being awarded for 1, saving in weight (over cast iron); 2 increase of power; 3 economy; 4 decrease of exhaust and water temperatures; 5 hardness; and 6 expansion.

Altogether this little volume contains in its 97 well illustrated pages a great amount of information which has heretofore not been available in such compact a form, and presents some phases of motor design which have not been taken up very extensively except in theory.

Taught to Fly in One Day

On Sept. 22, 1922, Kenneth M. Lane, a student of the Dayton Wright Airplane Company, and who had never previously touched the controls of a plane, started to take instruction early in the morning, and that evening made his first solo flight. His total instruction time was four hours and twenty-six minutes, the remainder of the day being spent in ground instruction and resting. The decision to conduct such a test was made as a result of numerous inquiries from students as to how many days it would require to learn to fly. Mr. Lane, who is 26 years of age, was chosen for the test because of two qualities which he possessed; education and an interest in athletics. The nature of his education was such as to develop mental alertness, while participation in athletics had developed the endurance necessary for the long day's grind.

The instructor, Walter E. Lees, since he started flying in 1915, has tested and instructed on many types of planes. The method of instruction employed has been worked out as a result of long experience and is a feature of this training school.

The plane used was the "Chummy," a biplane with an 80 hp. LeRhone rotary engine, designed by Col. V. E. Clark, chief engineer of the company. This ship is ideal for such work because of its excellent flying qualities and the side-by-side seating arrangement which enables the instructor to observe the student continuously and thus conveys greater confidence to the student, because he knows at all times just what is happening and can follow directions more closely than is usually the case.

Lieut. W. H. Brookley of McCook Field was official observer for the day, and C. F. Kettering, H. E. Talbot, Col. V. E. Clark and others, were interested observers when Mr. Lane made his solo tests.

Non-Spinnable Planes

Editor, AVIATION:—

I note in recent issue of AVIATION certain claims being set forth as to machines that are "non-spinnable."

In the winter of 1917-18, the undersigned flew the first VE7 airplane at Mitchel Field, which machine was "non-spinnable." A little casual thought on the balance between the fixed and horizontal tail services readily discloses how easy it is to make any machine "non-spinnable." In order to make it possible to stunt the VE7, or Vought as it is sometimes called, the elevator couple had to be increased so as to offset the too great static couple of the horizontal fixed stabilizer.

B. Q. JONES
Major, Air Service

Warning to Aviators

Some of the things that can happen to an unattended plane may be gathered from the following newspaper clipping.

GREENVILLE, O., Sept. 19.—While Ed Jacks and a companion from Dayton were seeing the sights at the County Fair here recently, leaving the airplane in which they had flown from their home in a field south of the Fair grounds, hogs ate one of the rubber tires of the landing wheels.

A trip to Dayton for a new tire was necessary.

Speed Tests of Flying Boats

By B. V. Korvin-Kroukovsky

Technical Engineer, Aeromarine Plane and Motor Co.

The accurate determination of the air speed of flying boats and seaplanes always presented considerable difficulties. Although it is possible to lay out the measuring mile along the shore, this would be good only for one direction of the wind, and if the direction of the prevailing winds does not coincide with the shore line, chances are that the course can be used only in exceptional cases. Location of the buoys and determination of their exact location is too tedious and expensive an operation to be used under ordinary conditions. Air speed indicators installed in the boats can not be relied upon to supply the accurate information, as long as there are no means of calibrating them. Facing the difficulties cited above, the Aeromarine Plane and Motor Co. developed during the past year the method described below, which proved to be very convenient in practical application, and which allowed the making of speed tests at any direction of the wind without previous preparations.

Using Three Lighthouses

For the making of the speed test, three lighthouses are chosen, which form the apexes of a triangle. The distances between the lighthouses are scaled from the chart and are correct to within a few yards. Mutual location of the lighthouses used by Aeromarine Plane and Motor Co. is shown on the accompanying sketch. The flying boat is flown around the triangle thus formed as it is shown by solid line on the sketch. For convenience of the observation, as well as to insure the strictly horizontal direction of the flight, the altitude on each leg is maintained between 15 and 30 ft., while at the corners the pilot climbs to any altitude he finds convenient for making the turn. The observer in the machine, stop watch in his hand, notes the time required for the machine to cover each leg of the course separately, entirely eliminating the effect of the turns.

Originally two observers were employed, the aim being to improve the accuracy by taking the average between two sets of observations. Experience showed, however, that this is not necessary, as the difference between the readings of two observers was within the error brought about by the small deviations of the boat from the straight path, variation in the wind velocity, etc.

In case higher accuracy is required, it is preferable to put the machine twice over the same course in opposite directions. This gives two entirely independent sets of data, from which the average air speed can be determined.

This procedure was followed in the test of Aeromarine-Navy six seater flying boat chosen to illustrate this article. The observed data are given in the columns 1, 2 and 3 of the table below. The runs I, II and III were made in anticlockwise direction, as shown by the arrows on the sketch, while the runs IV, V and VI were made over the same course in clockwise direction. In the last column of the table the ground speed is given, which is obtained by dividing the distance by the time, and transforming the results into miles per hour.

SPEED TEST OF "PENNSYLVANIA", APRIL 3, 1922

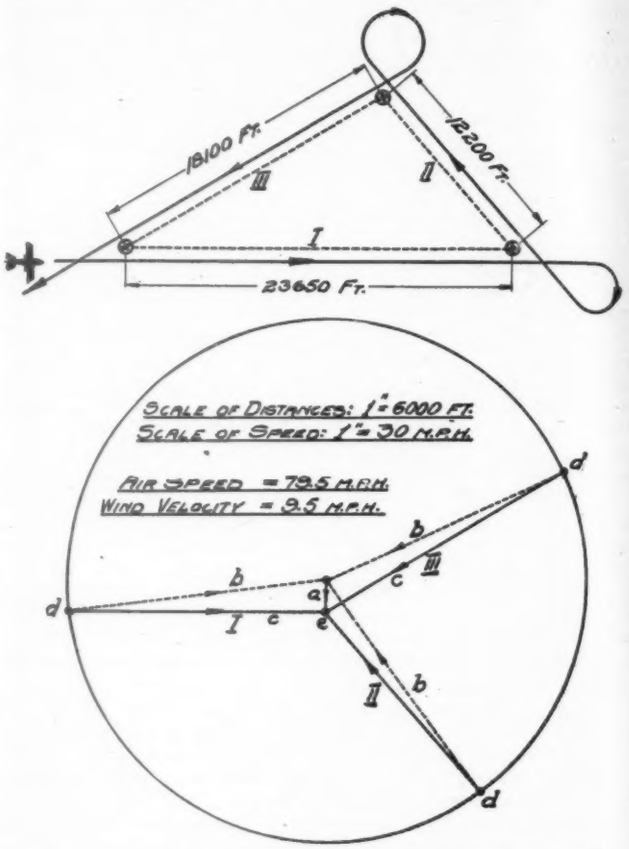
Run No.	Distance Ft.	Time Min. – Sec.	Speed m.p.h.
I	23,650	3 – 25.2	78.7
II	12,200	1 – 55.5	72.0
III	18,100	2 – 26.0	84.5
IV	18,100	2 – 47.0	73.9
V	12,200	1 – 34.0	88.5
VI	23,650	3 – 22.0	79.8

The air speed of the flying boat can be obtained now from the speed vector diagram, which is shown on the sketch for the first set of data. The diagram is based on the following assumptions:

1. The wind velocity vector (a) has the same magnitude and direction for any direction of the flight.

2. The airplane air speed vectors (b) have the same magnitude but different directions for the flights along each side of the triangle. They can be represented, therefore, by the radii of a circle, the center of which can be located at any arbitrary point. In this case we will locate it at the beginning of the wind velocity vector (a).

3. The vectors representing the observed ground speed are the resultants of the wind velocity and airplane air speed vectors and therefore can be represented on the diagram by



Diagrams showing method developed by the Aeromarine Plane & Motor Co. for testing the air speed of seaplanes

the lines joining the beginnings of the air speed vectors (b) with the end of the wind velocity vector (a). On the diagram these vectors are drawn in solid lines (c).

The method of procedure in the construction of the diagram is therefore as follows: Lay out the distances between the lighthouses to scale, and construct the triangle, which will give the relative directions of the flights. Choose any convenient point (e) on the paper, and draw through it the rays parallel to the sides of the triangle. Lay out to some definite scale the observed ground speed along each line, so that its direction is toward the point (e). This will locate the points (d). Find the center of the circle passing through these three points, and draw the circle. The radius of the circle will represent the true air speed of the airplane to the same scale as was used in laying out the ground speed, and the distance between the center of the circle and the point (e) will represent the wind velocity, the direction of which will be toward the point (e).

The accuracy of the method as a whole can be judged best by comparing the results obtained from two sets of data in the example given above. From the diagram for the first three runs we have:

Air speed of the flying boat .....79.5 m.p.h.
Wind velocity ..... 9.5 m.p.h

From the diagram for the last three runs (not reproduced here):

Air speed of the flying boat .....80.25 m.p.h.
Wind velocity .....11.5 m.p.h.

Attention is called to the fact, that the speed vector diagram is not an approximation, but is mathematically correct, and can be used, therefore, for determination of the air speed of an aircraft from the test made at any wind velocity, as long as the pilot was able to hold the machine on the straight path between the lighthouses. Moreover, if take-off and landing tests are carried immediately before or after the speed test, the speed vector diagram gives the most accurate means for determining the wind velocity, the knowledge of which is so important in comparison of these tests.

Stresses Produced on Airships by Gusty Air

Most airship pilots are of opinion that severe aerodynamic forces act on airships flying in bumpy weather. An exact computation of the magnitude of these forces is not possible as they depend on the strength and shape of the gusts and as probably no two exactly equal gusts occur. Nevertheless, it is worth while to reflect on this phenomenon and to get acquainted with the underlying general mechanical principles. It will be possible to determine how the magnitude of the velocity of flight influences the air forces due to gusts. It even becomes possible to estimate the magnitude of the air forces to be expected, though this estimation will necessarily be somewhat vague, due to ignorance of the gusts.

The airship is supposed to fly not through still air but through an atmosphere the different portions of which have velocities relative to each other. This is the cause of the air forces in bumpy weather, the airship coming in contact with portions of air having different velocities. Hence, the configuration of the air flow around each portion of the airship is changing as it always has to conform to the changing relative velocity between the portion of the airship and the surrounding air. A change of the air forces produced is the consequence.

Even an airship at rest experiences aerodynamical forces in bumpy weather, as the air moves toward it. This is very pronounced near the ground where the shape of the surrounding objects gives rise to violent local motions of the air. The pilots have the impression that at greater altitudes an airship at rest does not experience noticeable air forces in bumpy weather. This is plausible. The hull is struck by portions of air with relatively small velocity, and as the forces vary as the square of the velocity they cannot become large.

It will readily be seen that the moving airship cannot experience considerable air forces if the disturbing air velocity is in the direction of flight. Only a comparatively small portion of the air can move with a horizontal velocity relative to the surrounding air and this velocity can only be small. The effect can only be an air force parallel to the axis of the ship which is not likely to create large structural stresses.

There remains then as the main problem the airship in motion coming in contact with air moving in a transverse direction relative to the air surrounding it a moment before. The stresses produced are severer if a larger portion of air moves with that relative velocity. It is therefore logical to consider portions of air large when compared with the diameter of the airship; smaller gusts produce smaller air forces. It is now essential to realize that their effect is exactly the same as if the angle of attack of a portion of the airship is changed.

The air force acting on each portion of the airship depends on the relative velocity between this portion and the surrounding air. A relative transverse velocity u means an effective angle of attack of that portion equal to u/V, where V denotes the velocity of flight. The airship therefore is now to be considered as having a variable effective angle of attack along its axis. The magnitude of the superposed angle of attack is u/V where u generally is variable. The air force produced at each portion of the airship is the same as the air force at that portion if the entire airship would have that particular angle of attack.

The magnitude of the air force depends on the conicity of the airship portion as described in former notes (reference 1). The force is proportional to the angle of attack and to the square of the velocity of flight. In this case however the superposed part of the angle of attack varies inversely as the velocity of flight. It results then that the air forces created by gusts are directly proportional to the velocity of flight. Indeed, as I have shown in the notes mentioned,they are proportional to the product of the velocity of flight and the transverse velocity relative to the surrounding air.

A special and simple case to consider for a closer investigation is the problem of an airship immersing from air at rest into air with constant transverse horizontal or vertical velocity. The portion of the ship already immersed has an angle of attack increased by the constant amount u/V. Either it can be assumed that by operation of the controls the airship keeps its course or, better, the motion of an airship with fixed controls and the air forces acting on it under these conditions can be investigated. As the fins come under the influence of the increased transverse velocity later than the other parts, the airship is as it were unstable during the time of immersing into the air of greater transverse velocity, and the motion of the airship aggravates the stresses.

In spite of this the actual stresses will be of the same range of magnitude as if the airship flies under an angle of pitch of the magnitude u/V, for in general the change from smaller to greater transverse velocity will not be so sudden and complete as supposed in the last paragraph. It is necessary chiefly to investigate the case of a vertical transverse relative velocity u, for the severest condition for the airship is a considerable angle of pitch, and a vertical velocity u increases these stresses. Hence it would be extremely important to know the maximum value of this vertical velocity.

The velocity in question is not the greatest vertical velocity of portions of the atmosphere occurring, but differences of this velocity within distances smaller than the length of the airship. It is very difficult to make a positive statement as to this velocity, but it is necessary to conceive an idea of its magnitude, subject to a correction after the question is closer studied. Studying the meteorological papers in the Reports of the British A.C.A., chiefly those of 1909/10 and 1912/13, I should venture to consider a sudden change of the vertical velocity by 2 m/s (6½ ft./s) as coming near to what to expect in very bumpy weather. The maximum dynamic lift of an airship is produced at low velocity, and is the same as if produced at high velocity at a comparatively low angle of attack, not more than 5 deg. If the highest velocity is 30 m/s (67 m/h) the angle of attack u V repeatedly mentioned before would be $\frac{57.3 \cdot 2}{30} = 3.8$ deg. That is a little smaller than 5 deg. but the assumption of u is rather vague. It can only be said that the stresses due to gusts are of the same range of magnitude as the stresses due to pitch, but they are probably not larger.

A method for keeping the stresses down in bumpy weather is by slowing down the speed of the airship. This is a practice common among experienced airship pilots. This procedure is particularly recommended if the airship is developing large dynamic lift, positive or negative, as then the stresses are already large.

—*N.A.C.A. Technical Note*

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The Navy Bee-Line Racer (BR1)

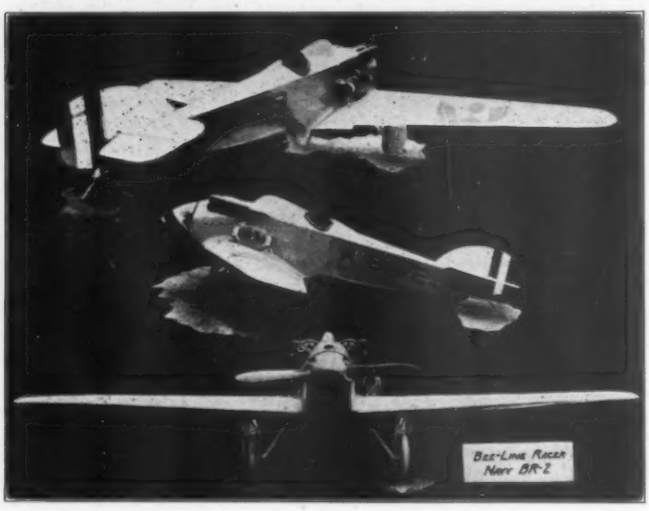
Cantilever Monoplane with Retractable Landing Gear And Wing Radiators Shows Interesting Innovations

By Frederick H. Johnson

Assistant Inspector of Airplanes, U.S.N.

The Bee-Line racer which the Navy entered in this year's Pulitzer Trophy race was designed by Arthur L. Thurston and Harry T. Booth, respectively president and chief engineer of the Bee-Line Aircraft Corp., of Hammondsport, N. Y.

This airplane embodies many notable features of design and construction. Chief of these may be mentioned



The Navy BR2 (Bee-Line) racer (380 hp. Wright). This particular ship has Lamblin radiators in place of the wing radiators used on the BR1

the wing surface radiators, the method of chassis attachment and retraction, the method of stub beam wing attachment, and the construction of the wings and engine mounting. A notable fact is that the completed machine checked with the design dead weight of 1635 lb. within 4 oz., in spite of 10 lb. of overweight in the engine. This is a remarkably light weight for a plane of more than 400 hp.

General Description

The Bee-Line Racer is a land monoplane using the "Göttingen No. 387" aerofoil section, and uses a special high compression Wright motor of 390 normal horsepower for a calculated speed as high as seems practicable for airplanes entered the 1922 races for the Pulitzer Trophy.

The engine is mounted directly on the front wing beam stub and is equipped with an engine driven gasoline pump. A Lamblin oil radiator is mounted on the bottom of the oil tank under the front of the engine. The carburetor is a Stromberg and the manifolds are of the "V" type. An altitude adjustment is provided.

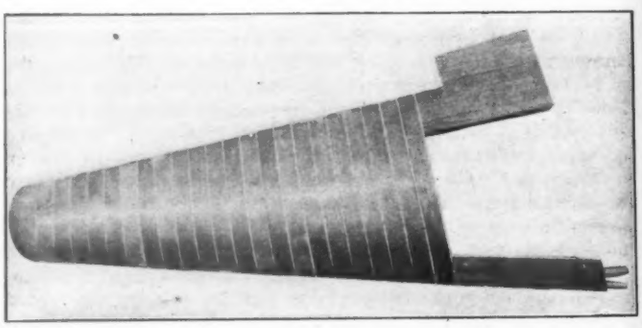
The fuselage is of longeron, strut and reinforced veneer type, of rectangular section forward of the cockpit and triangular section aft, similar to the S.V.A. A diagonal bulkhead from the bottom of the tail post forward, in connection with other transverse fuselage bulkheads and a solid veneer top under the turtleback, results in a fuselage of remarkable rigidity and light weight, without wire stays or turnbuckles.

Wings and Wing Surface Radiators

The wings are constructed as a rectangular, tapered 3-ply veneer box built around solid tapered spruce spars with three bulkheads without any internal wire bracing. The wing curves are superimposed on the top and bottom of this box by means of solid spruce ribs 5½ in. apart to which the wing surface radiator units are screwed on both top and bottom surfaces. Similarily spaced internal fore and aft ribs are glued and nailed to the inside bottom of the wing box before assembly, and spruce tie pieces connecting the internal bottom ribs and the external top ribs pass through close fitting rectangular holes cut in the top veneer and are glued and nailed at top and bottom, effectively tying the entire structure together in such a way as to hold the veneer rigidly to its support, while permitting considerable flexibility under load. Under sand test this wing deflected 17½ in. at the tip under 6.33 loads in high speed condition and returned to normal without any permanent set whatever.

Ailerons. The tapered ailerons are of reinforced plywood construction, extending the entire length of the wings outboard from the wing stubs, and are actuated by internal push and pull rods, concealed in the trailing edge of the stub beam portion of the wings, which encloses the stub on three sides.

The 44 wing radiator units are 5½ in. wide and their length varies with the tapering chord of the wing. They are each composed of two sheets of thin brass, longitudinally corrugated, and sweated together by a special process. Headers are embossed on the inner sheet to which external copper connecting pipes are soldered. Two welded steel inlet and outlet water manifolds pipes are concealed the entire length of the leading edge in front of the front wing beam, the nose webs being cut out to accommodate these pipes. Uniformity of flow is obtained by proper proportioning of the manifold passages. Water flows from front to rear through the top surface, returning to the leading edge through the bottom surface. The leading edge is effectively closed by a three section cap piece of lightened plywood screwed to stringers in the nose webs, to which an outer aluminum shield or molding is in turn screwed, closely housing the front ends of the radiator units, and forming a neat, strong leading edge.

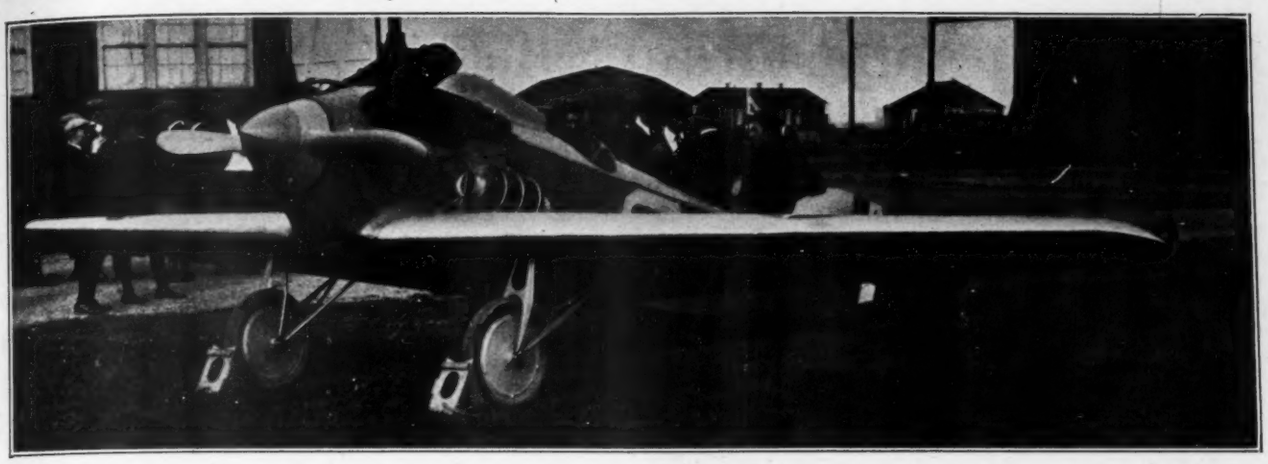


Wing of the BR2 (Beeline) racer. Note radiator units and water outlets

The wing hinges consist of steel saddles mounted on both beams and stubs, carrying hinge pin holes and hollow hinge pins of large diameter which transfer the loads from the pins to the proper surfaces of the beams and stubs in bearing. Four closely fitting hinge pins secured by nuts secure each wing rigidly in a fixed position.

Retractable Chassis

The retractable chassis consists of the two wheels each mounted in a double fork. The front fork on each side is flexibly connected at the top by rubber shock absorbers to a steel tube mounted in bronze fittings which are integral with the front



(c) International

Three-quarter front view of the Bee-Line racer. The wheels fold toward one another into apertures left in the fuselage

and rear outer wing stub hinge saddles. The rear forks are rigidly attached to universal hinge fittings hinged on the same fore and aft tubes as the front shock absorbing forks. The wheels are thus free to fold toward each other, each when actuated by a rod connected by universal joints to the inner ends of the short wheel axles. The other ends of the actuating rods are connected to two sliding bronze fittings which slide up and down on each leg of an inverted "V" brace, mounted on fittings bolted to the lower corners of the firewall bulkhead; when actuated by endless cables attached to the sliding bronze fitting. The cables pass over pulleys at the top and bottom of the inverted "V" braces and are actuated by winding on a single drum mounted just beneath the top vertex of the inverted V. This drum is mounted on and pinned to a shaft extending rearward under a cowl on the top of the fuselage over the fuel tank to a sprocket at the front of the cockpit. This sprocket is actuated by a chain and small sprocket and hand crank in the upper right hand portion of the cockpit. The sprockets and chain are protected by padding and guards. A "two point" safety leved actuates simultaneously the drum ratchet pawl (to retain in the retracting position, or release in the "down" position); and the safety latch which secures the bronze slide fitting in the "down" position, and releases in the "retract" position. In the air the wheels will fall by their own weight when the safety lever is moved to the "down" position, and lock in place automatically or by hand. The wheels can be retracted in eight seconds by hand, and are completely within the wing stub contour, and entirely concealed by a veneer and aluminum housing when drawn up.

Empennage

The stabilizer and fin are of rib-reinforced-3 ply veneer construction. The fin is braced laterally to the stabilizer by Stewart-Hartshorn stream-line wires. The stabilizer is adjustable on the ground by using blocks of varying thickness, the fittings being designed to permit five or six degrees of adjustment. There are no stabilizer braces to the fuslage. The elevators are of all steel construction, brazed and welded and covered with linen. They are mounted in place on the top of the fuselage about six inches forward of the tail post on an integral leading edge tube, and actuated by a concealed king post extending inside of the fuselage, and operated by a combination of push and pull rod, and cables from the control stick.

The rudder is of all steel construction covered with linen and is actuated by short king posts and cables inside the fuselage. The foot levers are of the adjustable suspended stirrup type.

Cockpit. The pilot is seated about 3 to 5 in. above the floor according to build and cushions. A shoulder safety belt of "pilot type" is provided. The stick is conventional, very sensitive, and easily moved without lost motion. The fire extinguisher, retracting safety lever and retracting crank are convenient to the right hand. The hand gasoline pump is of the wobble K-L type and located on the floor convenient to the left hand. The throttle and altitude adjustment are of standard Navy type, the altitude adjustment taking the place of the usual spark adjustment, wihch is not used on this engine.

Instruments

The ignition switch is directly in front on the dash. There are but five instruments on a miniature board in the left diagonal corner. A tachometer is provided as well as oil and gasoline pressure gages, and oil and water temperature gages. About three pounds gasoline pressure is carried on the carburetor but no tanks are under pressure at any time, the K-L system being used. 34 gal. (1½ hr.) fuel is carried in a tank mounted in front of the pilot. A comfortable padded seat back and streamline head rest is provided. Visibility is very good for racing purposes and the wings being considerably below the pilot do not obstruct his view in making landings. A flush plug socket for temporarily attaching starting hand magneto wire is conveniently located on the outside of the fuselage.

Forest Patrol Closes Busy Season

The hot weather of September surpassed anything the past summer, and the fire situation, if anything, was worse than earlier in the season. On one single day, 42 new fires were located on two patrols, which will stand as a record for some time. The heavy October rains however, stopped flying entirely and it is the opinion of the Federal, State and private forest protective agencies that these rains have eliminated further danger from forest fires this season. There being no more danger from fires, patrols are no longer needed, and every step is being taken to expedite departure from Eugene, Ore., in order to avoid unnecessary expenses with already limited funds.

The exact data on the work done and the results accomplished by this year's Forest Patrol are not available at this time, as they will necessitate weeks of work tabulating and arranging the various facts. Roughly speaking, four hundred new fires have been located from the air, with about 650 hr. flying time in ten weeks' time. It is safe to say that sixty-five thousand miles have been flown on patrols, and that an area of at least five million square miles covered. The above figures are based on rough off hand figures and are not guaranteed but give some idea of what has been accomplished.

The results as a whole have been very successful. To use the measure of satisfaction to the Forestry Service as a standard by which to gage the success of a Forest Patrol Season, the results have been more than gratifying. Various Forestry officials have time and again reiterated that they consider the system of taking Foresters over their own districts far superior to the old system of hiring permanent observers, and that they realize as never before the value of airplane patrol from their own personal experience as observers.

Aeronautical Safety Code

An Outline of the Work Accomplished by The Organizations Elaborating this Code

The project to develop an Aeronautical Safety Code which might serve as a guide in design, construction, maintenance and operation of aircraft was launched under the auspices of the American Engineering Standards Committee, which recognized as sponsors for this subject the U. S. Bureau of Standards and the Society of Automotive Engineers. The former has an active section of safety engineering; has already developed several safety codes and has been prominent in a movement for developing codes applicable in all industries through the machinery provided by the American Engineering Standards Committee. The other sponsor includes engineers with large experience in the design and construction not only of the gasoline engines which form the nucleus of airplane power plants, but also in the design and construction of the planes as well.

In carrying out this work the two joint sponsors organized a representative committee including delegates from a number of organizations known to be actively interested in this subject. The following organizations were included:

Aero Club of America
American Institute of Electrical Engineers
American Society for Testing Materials
American Society of Safety Engineers
Manufacturers Aircraft Association
National Aircraft Underwriters Association
National Advisory Committee for Aeronautics
National Safety Council
Rubber Association of America
Underwriters Laboratories
U. S. Coast Guard
U. S. Forest Service
U. S. Navy Department
U. S. Post Office Department
U. S. War Department
U. S. Weather Bureau

The decision to proceed with the development of this Code as a desirable and much needed adjunct to the development of aviation in this country was made at a preliminary meeting of those most actively concerned which was held in Washington on May 13, 1921, in the rooms of the National Advisory Committee for Aeronautics.

Experience shows that the development of any safety code, whether it includes legal minimum requirements or is a standard to be approached in the interests of uniformity and better understanding in the industry itself, requires several years of effort. Starting the development of this standard while the industry is young and before diverse and conflicting local customs and laws become well established, will secure, without serious friction, desirable uniformity of practice. One familiar with the diversity of customs and signals which have grown up locally in the operation of automobiles and the resulting difficulties in bringing about, now, a reasonable degree of nation-wide uniformity, will appreciate the value of having a national safety code grow with the aeronautical industry.

The Sectional Committee consists of thirty-one members. Its first meeting was held in New York City on Sept. 2, 1921, and the following officers were elected: Chairman, H. M. Crane, a representative of S.A.E.; Vice Chairman, Joseph S. Ames, a representative of N.A.C.A.; Secretary, M. G. Lloyd, a representative of Bureau of Standards; Asst. Secr., Arthur Halsted, a representative of Bu. of Standards.

Prior thereto a study of existing regulations and practices was made by the staff of the Bureau of Standards and a tentative draft of the proposed code was turned over to the committee as a foundation for this work. The committee divided the field up among five subcommittees, whose membership was not limited to the members of the Sectional Committee and which were appointed by the chairman as follows: Subcommittee on Airplane Structure; Subcommittee on Power Plant; Subcommittee on Equipment and Maintenance of Airplanes; Subcommittee on Lighter-than-Air Craft; Subcommittee on Airdromes, Traffic Rules, Signals and Qualification for Pilots.

The scope of the proposed code is shown by the following outline of its contents:

INTRODUCTORY PART

Scope and Application of the rules; Exceptions; General requirements; Nomenclature; Definitions.

PART I. AIRPLANE STRUCTURE—DESIGN, CONSTRUCTION AND TESTS

Design of airplanes; Arrangements; Construction; Wind tunnel; Static and flying tests; Inspection; Tests for materials and parts; Minimum factors of safety; Stress calculations.

PART II. POWER PLANT—DESIGN, CONSTRUCTION AND TESTS

Design of Power plant; Construction; Fuel tanks; Piping; Lubrication; Ignition; Cooling; Exhaust; Auxiliaries; Engine controls; Inspections and tests; Specifications and tests for materials; Factors of safety.

PART III. EQUIPMENT, MAINTENANCE AND OPERATION OF AIRPLANES

Instruments; Safety devices; Lights; Reinspection; Maintenance; Repairs; Shipments; Marking; Log records.

PART IV. SIGNALS AND SIGNAL EQUIPMENT

Signal equipment for airdromes and aircraft; Flags; Lights; Beacons; Radio; Signals.

PART V. LANDING FIELDS AND AIRPORTS

Classification; Size; Markings; Building restriction; Equipment; Hangars; Airways.

PART VI. TRAFFIC, FLYING AND PILOTAGE RULES

Rights of way; Flying over cities; Trick and exhibition flying; Ballast; Take-off; Landings; Air routes; Control.

PART VII. QUALIFICATIONS FOR AVIATORS AND AERONAUTS

Physical qualifications; Experience; Technical knowledge.

PART VIII. BALLOONS

Design and construction of balloons; Inflation; Equipment; Inspection; Maintenance; Log records; Traffic rules; Maintenance; Operation.

PART IX. AIRSHIPS—NON-RIGID, SEMI-RIGID AND RIGID

Design and construction of non-rigid, semi-rigid, and rigid, airships; Inspection; Tests; Specifications for materials; Equipment; Instruments; Maintenance; Inflation; Operating Rules; Mooring; Log records.

PART X. PARACHUTES

The development of the safety code in the subcommittees has progressed well. Some of the subcommittees have already made preliminary reports of parts of the safety code assigned them and others of the subcommittees have material practically ready for such preliminary reports.

These preliminary reports will be issued as tentative and made available for general criticism before they are revised and submitted to the Sectional Committee for its action of approval or recommendations for further study. When all the various parts now under development receive the approval of the Sectional Committee, the work will be published as the first edition of the American Aeronautical Safety Code. Persons sufficiently interested in the project to study and criticize the tentative drafts of the rules should communicate with the Secretary of the Sectional Committee.

The procedure of the American Engineering Standards Committee provides for the continuous study of such standards and revision from time to time as experience or progress and development in the industry may indicate to be necessary.

Night Flying by Air Mail Service

Chicago is to be the laboratory for night flying experiments of the Post Office Department looking toward the establishing of night service between Cheyenne and Chicago, if the tests are successful.

Maywood Field, the Chicago station of the air mail, will soon have lighting equipment for the tests. Workmen are now occupied installing light posts which will encircle the field. The plans for illumination also include floodlights around all buildings on the field for the purpose of throwing them into daylight perspective for the flier. Two cinder runways are also under construction and these will be bordered with lights. At each end of these two runways will be placed strong searchlights. When a flier comes in to make a landing a beam will shine down the runway in the opposite direction of the wind so the pilot can come in back of the light. This will provide for illumination without any glare in the eyes of the flier.

First experiments with night flying will take place in and around Chicago. Then a field will be located on the air route around 25 or 30 miles out of Chicago and this field will be equipped with an emergency landing beacon. Flights will be made between the two fields.

Many problems present themselves when night flying is considered—many problems which do not present themselves at first thought. On the landing fields buildings must be shown in daylight perspective, the limits of the field must be outlined by lights and the runways must also be outlined.

For the plane itself equipment of searchlights in the wings must be provided. It is found also that the glare of the exhaust pipes has to be hidden from the eyes of the pilot. Proper paint must be selected for propeller blades so the propeller will not reflect light. Parachute flares must be provided which will satisfy the demands of the pilot should he require them in a forced landing. Then the emergency field must be equipped with huge flashing beacons to act as markers every 25 miles for the pilot as he flies in the darkness.

The success of the Air Mail today is not due particularly to the greater reliability of the type of planes used—it is due principally to experience. Pilots flying day in and day out learn weather conditions, they learn the tricks of the air and they know their motors and their planes. Before the Post Office Department ever adopts night flying it wants to have such a wealth of experience on hand about night flying and all problems relating to it, that it can adopt the new service knowing it will be safe.

The Chicago field has been chosen for these first experiments because it was one of the best fields on the transcontinental route and because it will probably be one of the termini of the night mail service by air.

Maynard Benefit Meet November 19

The meet which is to be held at Curtiss Field for the benefit of the family of the late Melvin B. Maynard has been postponed to Sunday, Nov. 19, instead of Oct. 22 as originally contemplated. The change was made necessary by the close proximity of the latter date to the Detroit race meet, which would have made it impossible to ship some of the record-breaking ships to Mineola in time to take part in the benefit. It will thus be possible for flying fans near New York to see some of these ships in action.

The Army will send a contingent and many private and commercial planes are expected to participate. A varied program is being arranged by C. S. (Casey) Jones, chief instructor at Curtiss Field, who is in charge of all flying arrangements.

In addition to flying there will be some special events open to aviators that will be held on the ground, the exact details of which are to be announced later. Fred Stone's Circus will perform on the field, Mr. Stone having volunteered his and his company's services as a lifelong friend of the late Lieut. Maynard.

The entire proceeds of the meet will go to Maynard's family, which consists of a widow and four children and is intended chiefly to provide a fund for the education of the latter.

Effect of Tropical Climates on Airplanes

In a lecture before the Royal Aeronautical Society, (England), Air-Commodore H. R. M. Brooke-Popham, Vice Chairman of the Society, gave an interesting description of the new desert route between Cairo and Baghdad. He also dealt with the various difficulties to be overcome in flying airplanes in tropical climates.

He expressed the opinion that machines built, as at present, of wood are satisfactory so long as they are only to be flown in Egypt or Mesopotamia; but when it comes to machines flying regularly between England and these countries metal construction will probably be necessary. Shrinkage of timber as a result of the climate he considered more of a nuisance than a danger, but he thought it desirable that wings should be sent out from England uncovered with fabric, as in any case they have to be stripped on arrival for adjustment of internal fittings. Conditions are a good deal worse in Mesopotamia than Egypt, chiefly owing to the very great changes in temperature and humidity of the atmosphere during the day. In the desert there are sudden changes in the direction of the wind, which are very disturbing. On one occasion, just after midday the wind kept changing from East to North and back again in a few seconds. Two hours later it had completely died down, while five minutes later it was blowing steadily from the West.

Wastage in propellers is high, from splitting owing to heat and damage from small stones. Tires were another big item in upkeep, and gasoline constituted a heavy expense owing to evaporation and the carelessness of native labor in handling the container.

Aviation Progress in Congress

July 21. *Senate.*
Mr. Robinson had printed in the record a statement by Mr. E. F. Naulty concerning the strategical importance to the U. S. of Arctic flight routes.

Aug. 24. *House.*
Petitions. 6211. Petition of Aeronautical Chamber of Commerce of America (Inc.) favoring the passage of the Wadsworth bill (S3076) providing for a bureau of civil aeronautics in the Department of Commerce; to the Committee on Interstate and Foreign Commerce.

Sept. 1. *House.*
Mr. Wilson discusses the subject of poisoning the cotton boll weevil by airplane.

Sept. 2. *Senate.*
Mr. King. a bill (S3980) to provide for the reimbursement for money expended in the construction of hangars for the use of the Air Mail Service of the Post Office Department, to the Committe on Appropriations.

Sept. 11. *House.*
Announcement that the Senate has passed S.2467. An act to provide relief for the victims of the airplane accident at Langin Field.

Sept. 12. *House.*
Petition 6295. By Mr. Kissel: Petition of Aeronautical Chamber of Commerce of America (Inc.), New York City, N. Y., regarding Senate bill 3076, to create a bureau of aeronautics; to the Committee on Interstate and Foreign Commerce.

Kelso Returns to Spokane

Floyd Kelso, the first aviator to carry passengers over Spokane, Wash., has returned and joined the forces of the United States Aircraft fliers. "Mr. Kelso has a good record as a flier and has brought some of his sudents to Spokane where he will given instruction in our company's ships," C. H. Messer, head of the concern, said recently. "He will give daily instruction at the Parkwater municipal field and in addition will carry passengers there in our three-passenger plane."

Notice to Aviators

Pennsylvania

Bridgeville—Landing field—The Mayer Aircraft Corp., reports the existence of a landing field at Bridgeville, Pa., about 9 miles westward of Pittsburgh. The field is 1200 ft. by 800 ft., sodded and in excellent condition in all weathers, and marked with a 100-ft. circle and two arrows pointing east and west. In the southeast corner of the field is a black and white hangar large enough to accommodate six planes. The field is just northward of the Vanadium Steel Works, the white smoke from which can be seen at a great distance in clear weather.

Hangar equipped with wind cone; machine shop and radio on field.

High-test gas, oil, and supplies are available and a bus line passes the field.

Approx. position: 40° 25′ N., 80° 06′ W.

Virginia

Arlington Radio Station—Installation of aerological instruments—1. The installation of a recording wind vane, anemometer, and sunshine recorder on the 600-ft. radio tower at Arlington, Va., has been completed, and information concerning current wind conditions is now available to aviators. Data may be obtained by calling phone Washington "West 81" and asking for "Aerological data."

2. The following information of value to aviators is hereby made available:

(*a*) Current wind direction and velocity can be obtained instantly at all times and in any weather at an altitude of approximately 785 ft. above sea level (600 ft. above the surface at Washington).

(*b*) An indication of the thickness and probable duration of fog and low-lying clouds at Washington is given by the record of sunshine at the top of the tower.

(N. A. 10, 1922.)

Hampton Roads—Aeronautical Light established—On Aug. 17, 1922, a flashing white light every 4 sec., flash 0.8 sec. eclipse 3.2 sec., of 4000 candlepower, visible for 20 miles in a horizontal direction all around the horizon and vertically for 6 miles, was established near the corner of Hangar No. 1, Naval Air Station, Naval Operating Base, Hampton Roads, Va. on the bearings:

The light is exhibited 65 ft. above mean low water from a steel frame structure.

Approx. position: 36° 57′ N., 76° 18′ W.

(N. A. 9, 1922.)

Connecticut

Hartford—Power transmission line—A high tension power transmission line crosses the Connecticut River about one-fourth mile northward of the Hartford Municipal Aviation Field. The cable is suspended from towers about 70 ft. high. In bad weather these towers constitute a real menace to pilots following the river.

(See Notice to Aviators 7 (66) of 1921.)

(N. A. 10, 1922.)

New York

Long Island—Mitchel Field—Radio towers erected—Two radio towers have been erected at Mitchel Field, L. I., in the northeast corner of the reservation close to the water towers. These radio towers are 80 ft. in height and painted black and white. On top of the towers are two 40-watt electric lights, which are turned on during the hours of darkness.

Approx. position: 40° 44′ 30″ N., 73° 38′ 00″ W.

(N. A. 10, 1922.)

Aerial Bootleggers Active

A fleet of twenty-one airplanes is operating regularly between New York City and the Canadian border, smuggling liquor, according to Prohibition Director Ralph Day of New York, who declared that the "bootleg ring" through this means is "openly and flagrantly" violating the law. He said that both land and sea planes are being used.

"Land planes are operating from New York to Montreal, from where large cargoes of whisky and other liquors are being transported," he said. "These are equipped with trap bottoms, so that in case of arrest or contact with prohibition enforcement officials the trap can be sprung and the contraband dumped into the Hudson or into the sea. As a blind, some legitimate merchandise is carried.

"The seaplanes are operating between Montauk Point and Rockaway and ships at sea, and are also equipped so that liquor cargoes can be disposed of in case of detection on the part of officials. Another reason for the trap bottoms is to prevent enforcement officers from seizing the costly planes."

The prohibition authorities in New York are attempting, it was stated, to combat this fleet with a smaller fleet of three and sometimes four, planes. Their only weapons are the automatic pistols carried by the agents who go with the planes. Officials at New York headquarters would make no comment as to what success the prohibition air fleet has had in dealing with the airline bootleggers.

South African Airway Service

The organization of the South African Airways Co., Inc., with a capital of £200,000 subscribed in England, was recently made through the Department of Commerce by Vice Consul Chas. J. Pisar. A commercial aerial service in South Africa is planned within the year.

As soon as the company presents proof of its status and financial ability to the Minister of Defense, it is understood that the Government will place a number of valuable facilities at the disposal of the new air transport company, including the free training of pilots, use of landing fields, airdromes and hangars, providing for the repair and overhauling of planes and engines at cost, and the replacement of parts and fuel at replacement costs. The Postmaster General has also indicated that the Post Office will collect for and deliver to the company any public mail for conveyance by air, at a small fee additional, possibly only one penny per letter. The rate of 9d per pound is proposed for parcels carried, the company planning to collect and deliver goods for customers to and from the air depots by motor vans. Between the same points, aerial passenger fares are expected to be a little over the railway fares.

As preparations proceed the company hopes to commence operation by the end of 1922, concentration being placed on the opening of the main route from Cape Town to Johannesburg, commencing with landing stations at Worcester, Beaufort West, De Aar, Bloemfontein, Kronstad, and Johannesburg from which center pretoria will be worked.

The initial equipment of the company will comprise twelve Rolls-Royce engined planes. Each plane and ground station will be equipped with wireless phone and telegraph sets in order that machines will always be in touch with the two stations it is flying between. Arrangements with Messrs Cook and Sons are planned for collection and transportation of passengers and freight to and from stations.

After establishing the main route and a service similar to those now in operation on the continent, the company expects to extend their operation from Johannesburg to Burban. The Cape Town-Johannesburg-Pretoria route will probably be operated once daily each way, and the Johannesburg-Durban route twice daily each way, except on Sundays and Government holidays. The Cape Town-Johannesburg route will be worked in three relays—Cape Town to Beaufort West, Beaufort West to Bloemfontein, thence to Bloemfontein and from there to Johannesburg and Pretoria. Durban will be made on a through flight of three hours from Johannesburg. The pilots and machines will operate backward and forward on each relay, each flight averaging about 2½ hr.

The planes to be used will be single-engined of the latest type and capable of carrying a load of 4000 lb. or twelve passengers, for 4 hr. at an economical cruising speed of 105 m.p.h. and a maximum speed of about 130 m.p.h. They will be made so that they can be converted into freight carriers, being fitted with removable chairs, or may be utilized as combination freight and passenger carriers, taking 2000 lb. of freight and eight people. Every machine will be fitted with an Aveline automatic stabilizer.

"Who's Who in American Aeronautics"

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The biographical sketches of men who are prominent in American Aeronautics are printed periodically in AVIATION. The first series have been published in a more durable form, and revised issues will be published from time to time to take care of the frequent changes in station of Army and Navy officers, and such other changes as may occur. As errors and omissions are liable to occur in a compilation of this character, interested parties are requested to notify "Who's Who" Editor of the necessary corrections so the record may be kept up to date.

Thomas Caldwell Turner

TURNER, THOMAS CALDWELL, Lt. Col., Marine Corps, U. S. N.; born, Mare Island, Calif., March 29, 1882; son of William C. Turner and Mary J. (Walsh) Turner; married, Ethel Hartson Turner, Feb. 10, 1909.

Educated: Vallejo High School, Vallejo, Calif., Santa Clara College, Santa Clara, Calif.

Professional: Enlisted in U. S. Marine Corps Jan. 20, 1901; commissioned 2nd Lt. Aug. 27, 1902; Captain July 10, 1908; Major, Aug. 29, 1916; Lt. Colonel, July 14, 1921.

Aeronautical Activities: Junior Military Aviator Sept. 12, 1917; Naval Aviator, Feb. 1918; transferred to Aviation Section, Signal Corps, U. S. Army, Nov. 20, 1917; Officer in charge of flying, Ellington Field; Commanding, Taliaferro Field, Fort Worth, Texas; under instruction pursuit course, Rockwell Field, San Diego, Calif., Feb. 1919-April 1919; returned to Marine Corps April 20, 1919; Officer in charge of Aviation, U. S. Marine Corps Nov. 1920; commanded a flight of two DH4B airplanes from Washington, D. C., to Santo Domingo City, D. R. and return March 29-April 22, 1921.

Flying Rating: Naval Aviation, February 27, 1918.

Member: Aero Club of America.

Present Occupation: Lieutenant Colonel, U. S. Marine Corps.

Address: Headquarters U.S.M.C., Wash., D. C.; home, 3306 Highland Place.

Harold A. Strauss

STRAUSS, HAROLD A., Major, Air Service; born, Wilmington, Ohio, Sept. 11, 1887; son of Samuel R. Strauss and Anna (Dunham) Strauss.

Educated: Public schools, Franklin, Ohio; U. S. Naval Academy, 1908.

Professional: Officer, U. S. Navy, June 5, 1908 to March 28, 1913; Officer, U. S. Army March 29, 1913 to date.

Aeronautical Activities: Transferred from Coast Artillery Corps, to Air Service, July 1920; graduated Balloon School 1921; graduated Airship School 1921; Officer in charge training Airship School July 1921 to May 1922; chief of lighter than air section, Air Service Engineering Division May 1922 to date; Commanding Officer, First Transcontinental Airship Flight.

Flying Rating: Airship Pilot, Aug. 13, 1921.

War Service: Military, Intelligence duties, Panama Canal Dept. April 19, 1917-Aug. 1918; 33rd F.A. Sept. 19, 1918.

Present Occupation: Chief, Lighter than Air Section, Engineering Division, Air Service.

Address: McCook Field, Dayton, Ohio; home, 709 N. Bway.

Edwin B. Lyon

LYON, EDWIN B., Major, Air Service; born, Los Cruces, N. M., Dec. 8, 1892; son of William B. and Corie A. Lyon; married, Elsie Franzen.

Educated: U. S. Military Academy 1915.

Professional: Officer of U. S. Cavalry 1915-16.

Aeronautical Activities: Flying School, Aviation Section S. C. Dec. 1916; flight from N. Y. to San Francisco.

Flying Rating: Aero Club of America, license Jan. 1917.

War Service: April 1917-Nov. 11, 1918 Air Service.

Present Occupation: Major, Air Service.

Address: Army Base, Boston, Mass.; home, No. 5 Concord Ave., Cambridge.

H. S. Martin

MARTIN, H. S., Major, Air Service; born, Chicago, Ill., Feb. 14, 1892.

Educated: Public schools of Indiana and Illinois; U. S. Military Academy, 1913; M.S. M.I.T. 1917.

Professional: U. S. Army 1909 to date.

Aeronautical Activities: Aviation Section, S.C. and Air Service since Aug. 17, 1915.

Flying Rating: J.M.A.M.A. and airplane pilot.

War Service: Air Service U. S. Army.

Present Occupation: Major Air Service; Engineering Division.

Address: McCook Field, Dayton, Ohio; home, 26 Wistaria Drive.

George Kimball Burgess

BURGESS, GEORGE KIMBALL, Physicist; born, Newton, Mass., Jan. 4, 1874; son of Charles A. Burgess and Addie L. (Kimball) Burgess; married, Suzanne Babut, Jan. 5, 1901.

Educated: Public Schools of Newton, Mass.; Mass. Inst. of Tech. B.S. 1896; University of Paris (France) Sc.D. 1901.

Professional: U. of Michigan, 1900-1901; U. of California, 1901-1903; Assistant Physicist, Bureau of Standards, 1903-1905; Associate Physicist, 1905-1913; Physicist and Chief, Division Metallurgy, 1913; Member Foreign Service, American National Research Council, 1917-1918; Past-President, Philosophical Society of Washington, 1918; Member Requirements Div., War Industry Board, 1918; Member of Engineering Div. and Research Extension Div. of National Research Council, 1921; Chairman, Metals Committee, Federal specifications Board, 1922; Vice-Chairman Iron and Steel Comm., American Inst. Min. & Met. Engineers, 1922.

Aeronautical Activities: Member, Inter-National Aircraft Standards Board, 1917-1918; Chairman, Metals Comm. National Advisory Committee for Aeronautics, 1919 to date.

Books: Measurement of High Temperature (with H. LeChatelier).

Member: Cosmos Club, A.S.T.M.; American Physicist Society; Iron and Steel Institute (Gr. Br.); American Institute of Min. & Met. Engineers; Philosophical Society of Washington; Washington Academy of Sciences.

Present Occupation: Physicist and Chief, Division of Metallurgy, Bureau of Standards.

Address: Bureau of Standards, Washington, D. C.; home, 511 South Clifton Terrace, Washington, D. C.

James Clark Edgerton

EDGERTON, JAMES CLARK, Air Mail; born, Lincoln, Neb., Feb. 2, 1896; son of James Arthur Edgerton and Blanche Edgerton; married, Mary O. Robinette, Aug. 20, 1918.

Educated: Grammar school, Cold Spring, N. Y.; High school, Central, Wash., D. C.; Washington Technical, Law Course, Idaho.

Professional: Radio Instructor 1913-14; Forestry Survey 1915; Law Clerk 1916; Air Mail Service; Post Office Dept., Dec. 20, 1918 to date.

Aeronautical Activities: Princeton Ground School Oct. 1917; detailed Air Mail Pilot, May 15, 1918 to Aug. 14, 1918; flying Washington-New York until service taken over by Post Office Dept. Aug. 1918; appointed 1st Lt. flying status, A.S. Aug. 1918; discharged from army; appointed Chief of Flying Operations, Air Mail, Dec. 20, 1918.

Flying Rating: R.M.A., Air Service Feb. 20, 1918.

War Service: Enlisted Sig. Corps, July 1917; transferred Air Service Oct. 1917; discharged Dec. 20, 1918.

Member: American Meteorological Society.

Present Occupation: Supt. of Radio, Post Office Dept.

Address: Post Office Dept., Wash., D. C.; home, 15-3d St. N. E.

Albert E. Truby

TRUBY, ALBERT E., Colonel, Medical Corps, U. S. A.; born, Otto, N. Y., July 18, 1871; son of John Truby and Minnie (Ackerman) Truby; married, Elizabeth Downing, April 26, 1906.

Educated: Public Schools of New York; Cornell University; University of Pennsylvania, B.S. 1894; M.D. 1897.

Professional: Served until the outbreak of the Spanish American War as Resident Physician of the University of Pennsylvania Hospital; received a Commission in the Medical Corps of the Army and has served in that Corps since that time.

Aeronautical Activities: Assigned to duty as Chief Surgeon, Air Service, Feb. 1919 by War Dept. orders; served in that capacity until March 15, 1922.

War Service: Served throughout the entire period of the War as Colonel Medical Corps.

Present Occupation: Commanding Officer, Letterman General Hospital.

Address: War Dept., Washington, D. C.

Clarence N. Keyser

KEYSER, CLARENCE N., Meteorologist; born, Germantown, Pa., Oct. 10, 1892; son of Naaman H. Keyser and Emma G. Keyser; married, Mildred W. Davis, Dec. 29, 1917.

Educated: Public schools of Philadelphia; Northeast High School; Pennsylvania State B.S. 1914; University of Georgia, M.S. 1917.

Professional: Field service for the U. S. Dept. of Agriculture 1915; Faculty of the University of Georgia 1916 to 1917.

Aeronautical Activities: Enlisted in the Navy for aviation duty, Aug. 1917; completed Aviation Ground School, M.I.T. Jan. 1918; transferred to Blue Hill Observatory for Meteorological study; commissioned Ensign, Feb. 1918; in charge of training Navy meteorologists March and April 1918; ordered abroad for meteorological duty with Naval Aviation Units; duty at London and Calshot, England; Le Croisic, Pamboeuf and Guipavas, France; in charge of Meteorological Service for Naval Aviation in France; ordered home Jan. 1919 for duty in the Navy Dept.; in charge of the organization of a meteorological service for Naval Aviation as part of the permanent Naval establishment; commissioned Lieut. USNRF; remained in charge of the meteorological service of the Navy until placed on inactive duty, July 1922.

Books Written: Professional papers on meteorology in its relation to aviation.

Member: Fellow of the American Meteorological Society.

Present Occupation: Meteorologist.

Address: 1731 K Street, N.W., Washington, D. C.; home, Conduit Rd., Montg. Co., Md.

Philip Jackson Woodbury

WOODBURY, PHILIP JACKSON, Mortician; born, Somerville, Mass., April 19, 1896; son of Hiram B. Curries and Cornelia J. Curries; married, Ruth Rumrill, May 27, 1922.

Educated: High Schools of Fitchburg, Malden and Hillsboro, New England; Inst. of Anatomy and Sanitary Science, Boston, 1916.

Professional: Mortician, two years.

Aeronautical Activities: Ground school, Cornell University; Flying School of America, Ga.; Wilbur Wright Field, Payne Field, Carlstrom and Dorr Field, Arcadia, Fla.; completed Pursuit course at Arcadia.

Flying Rating: 2nd Lieut., Air Service; flying status July 1917.

War Service: Feb. 1917-Jan. 1919.

Member: Mass. Aero Club.

Present Occupation: Mortician.

Address: Prospect St., Goffstown, N. H.

Harvey Nathaniel Davis

DAVIS, HARVEY NATHANIEL, Mechanical Engineer; born, Providence, R. I., June 6, 1881; son of Nathaniel French Davis and Lydig Martin (Bellows); (1) married, Suzanne C. Haspell, June 28, 1911, died Jan. 1, 1919; (2) married, Alice M. Rohde, Sept. 20, 1920.

Educated: Providence High School, Brown A.B. 1901, A.M. 1902; Harvard A.M. 1903 Ph.D. 1906.

Professional: Instructor, Physics, 1905-1910; Asst. Professor 1910-1919; Prof. Mechanical Engineering 1919; Aeronautical Mech. Eng. Air Service 1919; Consulting Engineer to U. S. Bureau of Mines 1921 to Air Reduction Co. 1922.

Aeronautical Activities: Member Power Plants Committee of National Advisory Com. for Aeronautics 1919.

War Service: Full time on Helium program July-Dec. 1918 as civilian in Science and Research Dept., Bureau of Aircraft Production.

Books written: Marks and Davis; Steam Tables and Diagrams, Black and Davis: Practical Physics.

Member: Am. Academy of Arts and Sciences; Academy of Science; As. M. E. Am. Phys. Soc.; Am. Math. Soc.; Harvard Engineering Society; Cosmos Club.

Present Occupation: Prof. Mech. Engineering, Harvard.

Address: 221 Pierce Hall, Cambridge; home, 19 Ash Stret.

ARMY AND NAVY AIR NEWS

Air Service

Airship C2 Destroyed by Fire—The Army Airship C2, enroute from California to Langley Field, caught fire and was completely destroyed while being maneuvered out of a hangar at San Antonio, Tex., prior to resuming its journey. Seven men were injured including Maj. N. A. Strauss, the commander of the ship, but none seriously.

The following telegram sent by Major Strauss to the War Dept. gives a detailed account of the mishap:

"C2 completely destroyed while maneuvering from hangar at 9.15 this morning. Cross hangar wind of fifteen miles with occasional stronger gusts. Handling crew of 100 men. When ship was approximately one-half out of hangar strong gusts forced ship to ground. Orders given to maneuver ship back into hangar immediately. After maneuver started section of fabric six feet in diameter, to which handling guys and patches were secured, pulled out, followed by breaking of two windward handling guys, then followed by falling off of patches of third windward handling guy. Ship went to leeward into hangar door, resulting in breaking up of car and tearing of envelop together with rupture of gasoline tank. Approximately one-half minute after this occurred hydrogen caught fire with partial explosion followed by complete burning of ship except three surfaces."

The injured are Major Strauss, commander; Sergeant A. D. Albrecht, engineer; Maj. John MacD. Thompson, 8th Corps Area Headquarters; Capt. Nelson Walker, Ben Baines, newspaper reporter; Sergeant Harry Bills and Garcia Noranjo. None was hurt seriously.

The C2 started on its transcontinental flight from Langley Field, Va., on Sept. 24 at 12.22 a. m. The purposes of the flight were to establish a transcontinental airship route, to assist in the location of possible emergency landing fields for both heavier than air and lighter than air craft, and to demonstrate the capabilities of the present training type of airship.

* * *

Air Service Cooperates in Rescue Work of Entombed Miners—Crissy Field is ever equal to an emergency, as is evidenced by an occasion that recently happened at Jackson, Calif. Lieut. Col. Wm. E. Gillmore, the Air Officer, received an emergency call from H. M. Wolfin, Superintendent of Safety Industrial Accident Commission and Consulting Engineer of the U. S. Bureau of Mines that the Argonaut Mine, located at Jackson, Calif., had suffered a disaster, in that some 48 men were entombed in the mine, it being on fire somewhere in the vicinity of the 5,000 ft. level; further, that if there were any means by which he could get there that night he might aid by his professional experience in effecting the rescue of the entombed miners.

Little time was lost by Col. Gillmore in communicating an order to Maj. George H. Brett, Commanding Officer of Crissy Field, and Lieut. Leo F. Post was designated as pilot for the flight and was warming up his reliable DH for the arrival of Mr. Wolfin, who broke all traffic regulations in getting to Crissy Field.

The mining town of Jackson is nestled in the mountains southeast of Sacramento, Calif., about 125 miles from San Francisco, a country noted for its ruggedness and rich gold deposit. Lieut. Post drew a straight line on his map and just hung the old DH on it, making Jackson and landing Mr. Wolfin in a little less than two hours after Col. Gillmore received the telephone call. The actual flight consumed but 58 min. For a landing field the side of a hill, almost on the Argonaut Mine property, was used and proved very satisfactory.

Crissy Field practically conducted a ferry service to the mine, carrying civilians specially qualified to aid in the rescue work, as well as some Air Service and Signal Corps personnel, the latter installing telephones in the mine as the rescuers progressed.

The newspapers in the locality have been as one in commending the Air Service in their ready response. Major Brett also received a telegram from the Director of the Bureau of Mines, Washington, D. C., in which that official expressed his appreciation of the assistance rendered by furnishing airplane transportation in connection with the rescue work at the mine.

* * *

447th Squadron (Pursuit) Activities—On the evening of Thursday, Oct. 19, the 447th (Pursuit) Squadron, Capt. Peter H. McNulty commanding, held its second get-together dinner at the Army and Navy Club, New York City. Among those present as guests were, Col. Benjamin F. Castle, Commanding Officer, 314th Pursuit Group, of which the 447th Squadron is a member, Maj. R. I. McKenney, Chief of Staff, XII Army Corps and Maj. Henry Abbey of the office of the Corps Air Service Commander.

After dinner a meeting was held to discuss questions of interest to the squadron. Col. Castle brought up the project of having the Government grant a pilot the limit of war risk insurance when piloting in a service plane as a reserve officer. The necessity for an air port for New York was discussed and it was decided that a movement for the establishment of such an air port should immediately be started. All the members present expressed themselves very strongly on the unnecessary delays caused by the present regulations for the No. 609 examination. It was proposed that an attempt be made to have the period between examinations lengthened to a year or more in place of the present period of six months. At present the reserve officer is required to take time from business to take this examination as the Medical Research Laboratory is not open week-ends.

In order to supplement the training period during the summer, it was decided that the squadron would go to Mitchel Field and get in some flying time. This will undoubtedly become a regular thing for this progressive squadron as it is the first in this corps area to display such interest in its profession. The meeting was concluded with a speech by Major McKenney. He took up the subject of expansion of the Officers Reserve Corps. He said that the defense of the country in the next war would rest with the reserve officers. As a result of congressional inaction, much of the organization built up during the late World War has been destroyed. It is necessary for the reserve officers to establish the system of mobilization which, is so essential for effective action at the opening of hostilities. He also stated that his office is behind the reserve officers in all they did. The 447th squadron plans to continue its dinners and flying days throughout the coming year.

* * *

Practical Demonstration of the Uses of a Parachute—Lieut. Harold R. Harris, A.S., chief of the flying section at McCook Field, put a parachute to good use recently. The flier was testing a Loening pursuit monoplane which had been fitted at McCook Field with a set of experimental ailerons, as it had been deemed that the ship was too stable for certain service purposes. These ailerons were much larger than those normally fitted to this ship. Lieutenant Harris had just put the ship into a dive when he found that she did not promptly answer the controls. Eventually one of the ailerons is said to have come off entirely, whereupon the pilot jumped clear of the ship with his parachute. He landed safely in the back yard of a home.

Changes in Stations—The Adjutant General's Office announces the following changes in stations, etc. affecting the Air Service:

88th Aero Squadron transferred from Camp Knox, Ky., to Wilbur Wright Field, Fairfield, Ohio.

The name of Camp Bragg, N. C., announced as a permanent military post, is changed to Fort Bragg.

The airdrome at Kansas City, Mo., is named "Kansas City Airdrome, Richards Field" in honor of First Lieut. John F. Richards, A.S., killed in action over the enemy lines in the Argonne, France, Sept. 26, 1918. The airdrome at Boston, Mass., is named Boston Air Port.

The following Air Service flying fields and depots are announced as permanent military posts: Bolling Field, D. C.; Brooks Field, Tex.; Chanute Field, Ill.; Kelly Field, Tex.; Mather Field, Calif.; Selfridge Field, Mich.; Middletown Air Intermediate Depot, Pa.; and San Antonio Air Intermediate Depot, Tex.

• • •

Army Orders—Maj. Henry H. Arnold, A.S., is relieved from further duty at headquarters Ninth Corps Area, Presidio of San Francisco, Calif., with orders to assume command of Rockwell air intermediate depot, Rockwell Field, Coronado, Calif.

Staff Sergeant Lonnie M. Johnson, 1st Group, Selfridge Field, Mich. is transferred in the grade of sergeant to the detached enlisted men's list and is detailed to duty with the National Guard of Indiana, as sergeant-instructor of Air Service. He will be stationed at Kokomo, Ind.

Maj. Joseph C. Morrow, A.S., now at Station Hospital, Fort Sam Houston, Tex., will report to Brig. Gen. William R. Smith, U.S.A., president of an Army retiring board at headquarters Eighth Corps Area, Fort Sam Houston, Tex.

Capt. Hulbert S. Steenberg, Medical Corps, is relieved from duty at Bolling Field, D. C.. to proceed to Langley Field, Va., relieving Maj. Edward P Beverley, Medical Corps, who will proceed to Washington, D. C., and report at Bolling Field for duty.

• • •

An Appreciation—During the latter part of September, Air Service Reserve Officers who were stationed at Eberts Field, Lonoke, Ark., during the war, attended a reunion in New York City. They paid a visit to Mitchel Field in order to obtain flights in airplanes, and the treatment they were accorded is eloquently described by Lieut. J. E. Bullock, President of the Eberts Flying Field Association, in the following letter to General Patrick, Chief of Air Service.

"We just want to express to you, the Commanding Officer of the Army Air Service, our appreciation for the treatment accorded us at Mitchel Field, Sept. 22, 1922.

"We were in New York attending our Eberts Field reunion, and several of us, all reserve officers, went out to Mitchel to ask for a ride, expecting, we must admit, that we would not be any too welcome, and that most of the fliers there would look down upon us as hasbeens, and that we would be handled in accordance. (Almost every Reserve Officer with whom the writer is acquainted feels the same way, and I think a good many of them stay away from the fields and more active participation on this account.)

"You can imagine our pleasant surprise when we found that every last man with whom we came in contact not only seemed willing to have us there, but actually appeared *glad* to see us and to have us around. The Adjutant, who evidently is a tremendously busy man, even found time to arrange for lunch for us at the Officers's Club, and put us in touch with the Operations Officer, who, in cooperation with another officer, got a nice flight for us all.

"Although the Operations Officer was apparently more than snowed under with his duties, multiplied just then by the presence and demands of a number of Artillery and Engineer Officers, there for those maneuvers, he gave up a good share of his afternoon to us, and never for a minute let us believe that he was too busy to make us one hundred per cent welcome. He, with permission from Headquarters, attended our banquet that evening, and spoke to nearly forty reservists, all in our bunch at Eberts during the war.

"To his kindness and consideration is due the change in our conception of and attitude toward the Air Service, and on his account especially we will have a warm spot in our hearts for Mitchel Field. If more of the Reserve Officers could only get in touch with officers of his type the Reserve would soon be a whole lot closer to the active end of the Air Service."

• • •

The Air Service in Germany—As a result of a further reduction in the strength of the American Occupation Forces in Germany, the only remaining Air Service detachment, consisting of 13 officers and 88 enlisted men, will return to the United States.

Naval Aviation

Commander Hunsaker on N.A.C.A.—The appointment by the President of Commander Jerome C. Hunsaker, in charge of the Design Section of the Naval Bureau of Aeronautics, as a member of the National Advisory Committee for Aeronautics, to succeed Rear Admiral D. W. Taylor, formerly Chief Constructor of the Navy is announced. Following the withdrawal of Admiral Taylor from active duty, Commander Hunsaker, who has been active in the design of naval aircraft for ten years and was formerly one of Admiral Taylors assistants, was designated as his successor.

Commander Hunsaker is a native of Creston, Iowa, and graduated from the Naval Academy in 1908. In 1912 he graduated from Massachusetts Institute of Technology as a Naval Architect. After a year abroad studying aeronautics he returned to this country and served as instructor of aeronautical engineering and research in aerodynamics at Boston "Tech" where he trained a number of experts in aeronautical construction.

Commander Hunsaker was the first American to make a study of Eiffel's work and the first to undertake the construction of a wind tunnel for testing of model airplanes as the basis of design. He developed the first original American aircraft designs and in the Aircraft Division of the Naval Bureau of Construction under Admiral Taylor he designed the first modern airship produced by the Navy, later developing the C and D Types of non-rigid airships. With Commanders Westervelt and Richardson of the Navy he designed and supervised the construction of the Navy's trans-oceanic flying boats, the famous NC's. He is the possessor of the Navy Cross, awarded for his research and development of naval aircraft.

• • •

Navy Orders—Lieut. Edward W. Rounds (Construction Corps) has been relieved from duty at the Bureau of Aeronautics with instructions to report at the Naval Aircraft Factory, Philadelphia, Pa.

Ens. Harold J. Walker has been transferred from the Naval Air Station Pensacola, Fla., to U.S.S. Bruce.

Lieut. Grover C. Wilson (Medical Corps) transferred from Naval Air Station Pensacola, Fla., to Naval Hospital Charleston, S. C.

Coming Aeronautical Events

AMERICAN

Nov. 10-12 — *Second Annual Hartford Aviation Meet, Hartford, Conn.*

Nov. 19 — *Aviation Meet to assist the family of late Lieut. Belvin W. Maynard, Curtiss Field, L. I.*

FOREIGN

Dec. 15- — *8th International Aeronautic Exposition,*
Jan. 2, 1923 *Paris, France.*

Foreign News

Poland—An airplane passenger service between Danzig, Warsaw and Lemberg, has been inaugurated by the newly organized Warschauer Luftverkehrgesellschaft Aero-Lloyd, G.m.b.H. The technical organization as well as the Danzig agency will be in charge of the Danziger Luftpost, G.m.b.H. The planes to be used are of the Junkers type and heretofore have been operated in the service of the Danziger Luftpost.

Services are as follows: Monday, Wednesday and Friday; leave Danzig 8 a. m., arrive Warsaw 10.30 a. m., leave Warsaw 1 p. m., arrive Lemberg 4 p. m. Tuesday, Thursday and Saturday; leave Lemberg 8 a. m., arrive Warsaw 11 a. m., leave Warsaw 3 p. m., arrive Danzig 5.30 p. m. Ie is planned to establish a daily service later in the month.

The fare is but little higher than by rail, the rate at present being 42,000 Polish marks (approximately $5,50 at present rates) to Warsaw, and 70,000 Polish marks ($9.25) to Lemberg. Besides passengers the planes carry mails and freight.

* * *

France—The Aeronautical Museum at Chalais-Meudon reports that since its inauguration on Nov. 23 of last year up to Aug. 31, its collection has been visited by over 9000 persons, or an average of one thousand per month. The administration has decided to close the museum pending enlargement and the addition of many new and interesting exhibits among which the following are announced: Five complete machines, including a commercial Junkers and the Pescara helicopter; a complete dirigible nacelle, with three motors; eight different propeller transmissions, including the Linke Hoffman four-motor to one-propeller transmission; five motors; a collection of photographic apparatus and material; four scale models of dirigibles and thirteen airplane models; a miscellaneous collection of instruments, motor accessories, etc.

* * *

China—Aviation in China does not appear to be in exactly a flourishing condition. The Vickers "Vimys" and Handley Pages which were to be used for commercial air mail services in various directions from Pekin have not yet been allocated to regular work of that nature. A good deal of joy riding has been done with some of the Vimys, which have been used particularly for conveying Chinese and other excursionists from Pekin to the Great Wall of China.

The political situation in China is so thoroughly chaotic that it is impossible to discover whether the various airplanes belong to the government army or to the army of one or other of the various generals.

* * *

Italy—The new law promulgated by the Minister of War for the regulation of commercial flying provides that any pilot who has not flown at least one hour for six consecutive months, loses the right of exercising his profession in commercial work. In such a case his license and flying record book are withdrawn and will not be reissued unless the complete qualification test is repeated.

The Minister of War, Hon. Soleri has forwarded a circular to all the Italian constructors of airplanes and airships inviting them to send the most modern types of planes to the Capital of Brazil, in order to uphold the prestige of Italian aviation. He has also decided to send several types of small airships that have been experimented with success during the last stages of the war and after the Armistice.

* * *

Portugal—An aviation company has been organized in Portugal to exploit the somewhat neglected interior of the country. It is contemplated to connect Lisbon with the rest of Europe by a short line to Paris which includes Madrid, Victoria and Bordeaux on its itinerary. Two additional lines are contemplated from the capital north and south through some of the most difficult flying country in all Europe.

The same company intends to start a combined passenger and freight service in the Portuguese colonies in Africa. Work has begun on the preparation of a commercial flying field, flying operations to be started in the spring of 1923 with Farman Goliaths.

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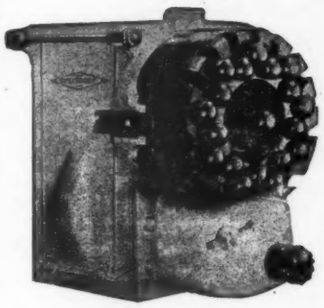

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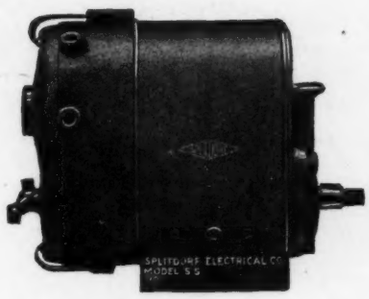

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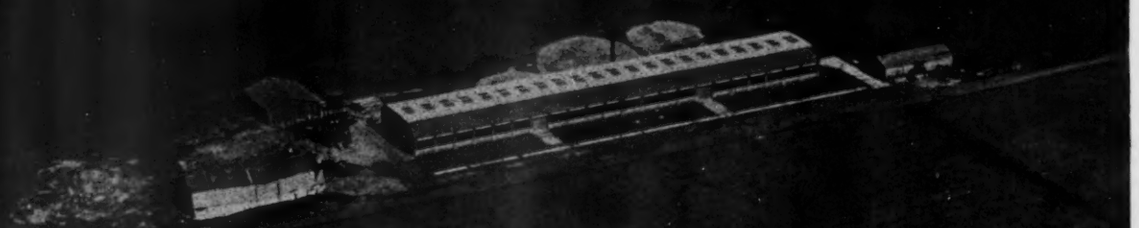

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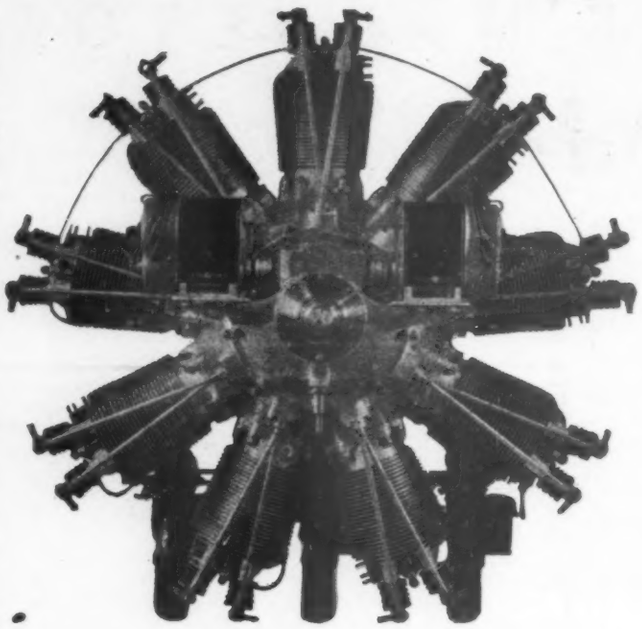

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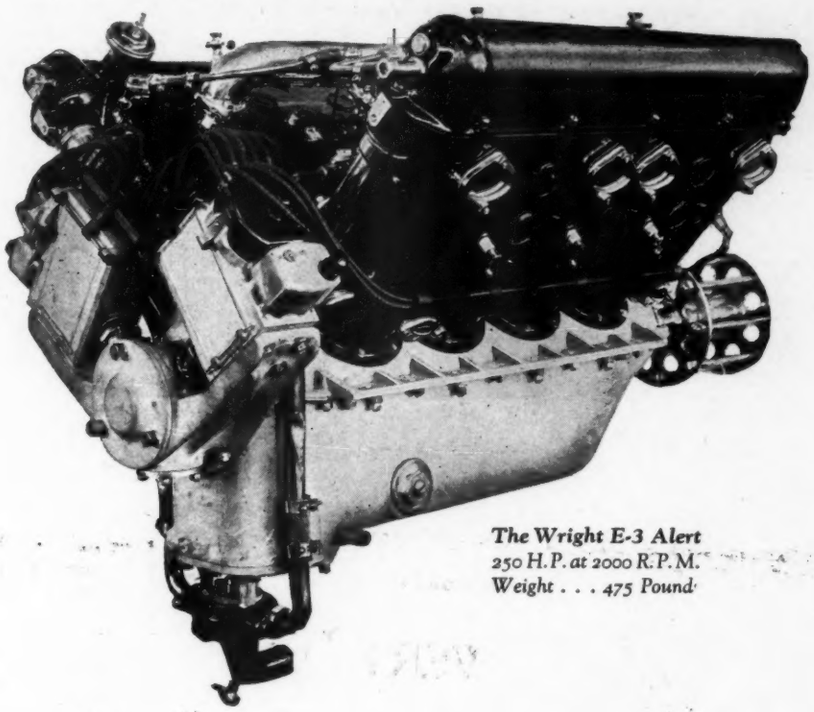

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